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ABSTRACT

These proceedings report the results of 10 years of ongoing research by the Malaysian Child Development Project to develop and implement measures to study the cognitive, language, and socioemotional development of Malaysian preschool children. Part 1 of the report contains opening speeches delivered by conference organizers and dignitaries. Part 2 presents 16 papers delivered at the conference. They are: (1) "Physical Development: Present Status and Future Objectives" (J. O. Forfar); (2) "Physical Growth" (Chen Siew Tin); (3) "Sanitation and Child Development" (K. Chandra Sekhar); (4) "Nutrition and Child Development" (Ong Kah Guan and Prabha Joginder Singh); (5) "Cognitive Development of Preschool Children" (Chiam Heng Keng); (6) "Language Development--A Process of Children's Creative Construction" (Fatimah Haron); (7) "Socio-Emotional Development of Preschool Children" (Leonard Young); (8) "Parental Involvement in Promoting Physical Growth and Development of Children" (Wong Mee Lan); (9) "Parental Involvement in Children's Psychological Development" (Khoo Kim Choo); (10) "The Child, Health, and Child Care" (Khairuddin Yusof); (11) "Psychological Development In Child Care Centre" (Chiam Heng Keng); (12) "Children in Plantations" (A. Navamukundan); (13) "Maternal Employment and Child Care" (Tey Nai Peng); (14) "Physical Environment and Child Development" (Cheng Yin Mooi); (15) "Psychological Environment and Child Development" (Chiam Heng Keng); and (16) "Ecology of Young Child Nutrition in Malaysia" (Mirnalini Kandiah). Part 3 contains the reports of five workshops on, respectively, child care centers, maternal employment and child development, physical environment and child development, psychological environment and child development, and nutrition and child development. Two appendixes list the organizing committee and the conference program. (MDM)

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OUR FUTUR

PROCEEDINGS OF THE CONFERENCE O
CHILDREN - OUR FUTURE

Organised by Child Development Centre &
Faculty of Medicine, University of Malaya
19 - 21, November 1991

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SECURING OUR FUTURE

Proceedings of the Conference on Children - Our Future

Organised by Child Development Centre &
Faculty of Medicine, University of Malaya
19-21, November 1991

Edited by:
Chiam Heng Keng

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Acknowledgements

The Organising Committee would like to express their deep gratitude to the many individuals, institutions and organizations who have helped to make this Conference possible.

We wish to thank Yang Berhormat Dr Fong Chan Onn for officiating the Opening Ceremony of the Conference on behalf of his Minister, Yang Berhormat Datuk Amar Dr Sulaiman Daud and launching the book, *Child Development: Preschool Children.*

Our grateful thanks to Yang Amat Berbahagia Toh Puan Datin Hajjah Dr Aishah Ong for closing the Conference and chairing the final session.

We are indebted to the Bernard van Leer Foundation for sponsoring the Malaysian Child Development Project and being the main sponsor of the Conference. We are also indebted to our other sponsors, Friedrich Ebert Stiftung, Nestle (M) Sdn. Bhd., The British Council, Malaysian Airline System and MBf Education Group Sdn. Bhd. Our special thanks to Friedrich Ebert Stiftung for sponsoring the publication of this Proceeding.

Our thanks to the Vice-Chancellor, Yang Berbahagia Dr Mohd Taib Osman, for his encouragement and moral support and to Associate Professor Othman bin Mohd Noor, Deputy Vice-Chancellor for representing the Vice-Chancellor at the opening ceremony.

Our gratitude to the Dean of the Faculty of Education and Faculty of Medicine for their encouragement and support. Our thanks to the Heads of Department of Pedagogy and Educational Psychology, Paediatrics, Parasitology, and Social and Preventive Medicine for their support and encouragement.

We are also grateful to all the Speakers, Resource Persons and Chairpersons; without their contribution the Conference would not have been possible.

Our thanks are also due to Mr Michael Tang for his advice on the poster design and other creative matters as well as to Ms Yap Yee Men of Ogilvy & Mather (M'sia) Sdn. Bhd. for the design of the poster, souvenir programme and logo.

We owe much to the University of Malaya and individuals from the various faculties and departments for their co-operation and support. The Organising Committee is unable to name each and every individual who has contributed to the Conference. We thank them all.

Editor's Note

This Conference, Children - Our Future, is, as one of the leading newspapers in Malaysia so rightly puts it, the grand finale to a 10-year study. The researchers of the Malaysian Child Development Project (MCDS) spent five years in designing, constructing, testing and validating the instruments for measuring children's cognitive, language and socioemotional development, and five years in studying the development of preschool children. Many human hours had been put into this study as, every year for the last four years, at least seven lecturers from the Faculty of Education and the Faculty of Medicine at the University of Malaya and fifty research assistants, not counting the technicians, were out on the *fields* to measure the physical, intellectual, language and socioemotional development of children of three to six years of age. This study looks at children's development from the psychological, medical and educational perspectives and it is both a longitudinal and a cross-sectional study. Even in developed countries, a study of this scope and magnitude is rare. Hence, it is not unexpected that the researchers of MCDS are eager to share the wealth of information which they have collected with other Malaysians and their Asean neighbours.

The Conference was organised with the following objectives:

1. To examine the status of physical and psychological development of culturally advantaged and deprived children;
2. To examine the contribution of heredity and environment to children's development;
3. To propose strategies for the development of children.

The researchers of MCDS felt that it would be better to discuss children's development in a wider context so that they, other researchers, practitioners and clients in early childhood education would get a wider and perhaps, a more balanced, perspective of children's development. Thus, speakers from developed and neighbouring countries were invited to present papers. One of our invited speakers, Professor Sandra Scarr, who is a very well-known child psychologist, particularly in the area of nature versus nurture, controversy and child care, was unable to make the trip at the eleventh hour, owing to her illness. In spite of her much missed presence, the participants and speakers benefitted from the Conference.

This Proceeding contains the papers of the plenary sessions, resource papers of the Workshops and Workshop reports. Some papers had been revised by their authors.

The views of the authors are strictly their own and do not, in any way, reflect those of the Malaysian Child Development Project or those of the Organising Committee.

The Organisers of the Conference would like once again to thank all those who had contributed to the success of the Conference and the publication of this Proceeding, which owes much to the staff of Friedrich Ebert Stiftung and my assistant Ms Melinda Yeoh. Friedrich Ebert Stiftung has also kindly sponsored the publication of this Proceeding.

Chiam Heng Keng

• Part One •

Covering Speeches

Opening Address of the Organising Chairman

Yang Berhormat Timbalan Menteri Pendidikan, Dr Fong, Yang Berhormat Toh Puan Tan Siew Sin, Yang Berbahagia Profesor Madya Othman Mohd Noor, Timbalan Naib Universiti Malaya, Puan Sri-Puan Sri, Datuk-Datuk, Datin-Datin, Tuan-tuan dan Puan-puan yang saya hormati sekalian. Bagi pihak Jawatankuasa Pengelola, saya ingin mengucapkan ribuan terima kasih kepada Yang Berhormat Dr Fong, Timbalan Menteri Pendidikan kerana beliau sudi melapangkan masanya untuk merasmikan Majlis Pembukaan Persidangan ini dan terusnya melancarkan buku *Child Development: Preschool Children*. Yang Berhormat, izinkan saya membentangkan ucapan saya dalam Bahasa Inggeris kerana sebilangan peserta dari luar negeri.

Ladies and gentlemen, it gives me great pleasure to be able to address you as the Chairman of the Organising Committee of the Conference on Children - Our Future. The idea of hosting a conference to disseminate the findings of the Malaysian Child Development Project was conceived in 1987 when we were pouring over the analyses of the data we collected in 1986 because many of the findings were an eye-opener while others confirm our suspicions. Our excitement was tempered by prudence which cautioned us to tread carefully. It was not easy to hold back to dig further into the subject to gather more information. We wanted to let the whole world know what we had found, particularly as malpractices in child development were mushrooming around us. Child care and education, for the matter, have become highly commercialised in the last few years. Unscrupulous vendors, knowing of the parents' desperation to give their children an early start in life, an advantage over other children, have no qualms of the untold damage they are inflicting upon young, helpless children. Educated parents who, normally are wise in their decisions, become quite naive in matters of child development. We hope that this conference will not only permit parents and the public to see children in a new light - as precious individuals whose potentials need to be carefully nurtured to bear fruit, not immediately but in the future - but we also hope that the Conference will provide the forum for interchange of ideas and experiences between experts and practitioners. We need each other and we need to work together for the good of the child and the nation. If we are open to new ideas, suggestions and even criticisms and are willing to learn from each other, I am sure, in this Conference, we will be able to come up with a number of concrete proposals which can be implemented.

I am very pleased to observe that this Conference has attracted participants from all walks of life. This, therefore, promises a rich cross-fertilisation of ideas. I know that we, the experts, researchers, lecturers and trainers have a great deal to learn from preschool teachers, childminders, care providers and parents. Let us hope that, at this Conference, there will be a meeting of minds. However, the speakers are going to have a tough time, catering to the needs of a wide range of interests and concerns. But, I am sure with goodwill and patience, all of us will have a fruitful time.

We are delighted that a number of participants are from our neighbouring countries, especially our closest and dearest neighbour - Singapore. I would also like to extend a very warm welcome to Ms Elly A. Sutardjo - the sole representative from Indonesia and Ms Ratchanee Kunepong from Thailand. I am sorry that the Philippines is not able to send a representative. Though our Asean participants are outnumbered by Malaysians, we hope that you will not feel overwhelmed and you will be equally, if not, more vocal.

Organising this Conference is not easy. This is because we have also to complete our book, *Child Development: Preschool Children* so that it can be launched in conjunction with this Conference. It is important for us that these two events occur at the same time because both the Conference and the book are based on the research findings of the Malaysian Child Development Project. At this juncture, I would like to thank Nr Ng, the Managing Director of Pelanduk Publications for his faith in our work and Mr Woo, his editor, for his cooperation and meticulous editing.

Before I invite the Deputy Chancellor of the University of Malaya to address us, I would like to take this opportunity to express my gratitude to all those who have contributed to the success of this Conference. There are many and it is not possible to thank all of them. However, I would like to thank the Bernard van Leer Foundation for its very generous grant which enable us to carry out such a massive project. For the last four years, 50 research assistants and 18 newly qualified doctors went out in five teams yearly to examine and test the children. The Bernard van Leer Foundation has also generously supported us financially in this Conference, especially in sponsoring participants from the non-governmental agencies. We would also like to express our gratitude to the other sponsors, Friedrich Ebert Stiftung, Nestle, The British Council, MAS and MBf. Without their generous support, the fees would have to be much higher. Our thanks to the Vice-Chancellor, the Deans of the Faculty of Medicine and Education, the Heads of the Department of Pedagogy & Educational Psychology, Paediatrics, Preventive and Social Medicine and Parasitology for their unfailing support, the staff of PJ Hilton for their assistance and cooperation and the media for the media coverage and publicity. Most of all, I would like to thank you, the participants, for supporting our vision - to secure a future for our children and our country.

Ucapan Timbalan Naib-Canselor

As-salamu-alaikum..... dan salam sejahtera. Yang Berhormat Dr Fong Chan Onn, Timbalan Menteri Pendidikan Malaysia,Yang Berbahagia Dr Rahimah, Dekan Fakulti Pendidikan, Yang Berbahagia Dr Domala, Wakil Dekan Fakulti Perubatan, Yang Berusaha Profesor Chiam Heng Keng, Pengerusi J\K Pengelola Persidangan, Dhif-Dhif yang kehormat, Tuan-tuan dan Puan-puan yang saya hormati sekalian.

Terlebih dahulu saya ingin sampaikan salam daripada Tuan Naib-Canselor, Dr Haji Mohd Taib Osman, yang tidak dapat bersama-sama kita pagi ini. Seterusnya saya, bagi pihak Universiti Malaya, ingin mengalu-alukan penyertaan tuan-tuan dan puan-puan dalam Persidangan ini, serta juga kehadiran Yang Berhormat, dan Para Jemputan, di majlis perasmian pada pagi ini.

Saya difahamkan Persidangan ini dikelolakan oleh Pusat Perkembangan Kanak-kanak, satu usaha sama di antara Fakulti Perubatan dengan Fakulti Pendidikan. Ini merupakan satu usaha sama yang boleh dibanggakan dan saya rasa penyertaan kedua-dua fakulti ini amat sesuai dan tepat sekali kerana ahli-ahli kedua-dua Fakulti itu terdiri daripada pakar-pakar dalam bidang-bidang yang relevan kepada pembangunan kanak-kanak secara terus.

Saya berasa gembira melihat sambutan yang begitu baik kepada Persidangan ini daripada kalangan cendakiawan dan ibu-bapa, dan saya berharap tuan-tuan dan puan-puan dapat sama-sama belajar mempelajari, berkongsi pengetahuan dan pengalaman tentang pembangunan kanak-kanak, ataupun secara lebih personal lagi *membesar anak-anak.*

Kita sedar bahawa dalam hal ini, seperti juga dalam banyak hal-hal lain, pengaruh edaran zaman merupakan faktor yang amat kuat. Suasana dan

keadaan sekitaran anak-anak kita jauh berbeza daripada apa yang terdapat pada masa kita dahulu. Ini semua menimbulkan isu-isu baru yang dahulunya tidak timbul *ataupun* tidak merupakan perkara yang perlu diambilkira dalam perkembangan kanak-kanak.

I am very pleased that the Child Development Centre at the Faculty of Education and the Faculty of Medicine have undertaken to investigate the development of Malaysian children. I know the importance of having an objective, unbiased picture of the situation as well as appropriate and sufficient empirical data. I am proud to note that the Child Development Centre is the forefront in child development. I pray they will continue with their work and the Malaysian Child Development Project will be the first of many more multidisciplinary projects which the Centre will undertake. We also hope that more firms will come forward to support us in our quest for understanding and developing children.

I am very sure that these three days will be very fruitful for all of you. The Organisers have carefully selected the speakers so that they bring to you the best. Although working papers are very important in any conference, what is equally important is the sharing and interchange of ideas, viewpoints and experiences. I hope that you will take this opportunity to express your concerns and problems. I urge you the practitioners, that is kindergarten teachers, childminders and parents, to speak up. The ideas of experts, no matter how brilliant, are worthless if they are not utilizible and I am quite sure the experts welcome your suggestions and reactions.

I hope you will also use the opportunity to know one another. This Conference should be the beginning and not the end of your friendship. There should be life after the Conference.

On behalf of the University Malaya, I would like to thank everyone of you for your interest and participation in this Conference. Together we can map out a future for our children and our nation. I would like to take this opportunity to say *syabas* to Professor Chiam, the Organising Chairman and her team for successfully organising this Conference.

Akhir sekali bagi pihak Universiti Malaya saya ingin mengucapkan ribuan terima kasih kepada Yang Berhormat Dr Fong Chan Onn, Timbalan Menteri Pendidikan Malaysia, di atas kesudian beliau melapangkan masa untuk bersama-sama kita pada pagi ini.

Terima kasih.

Ucapan YB Timbalan Menteri Pendidikan

Dalam pembukaan rasmi Persidangan Kanak-kanak -- Harapan Kita pada 19 November 1991, di Hilton Petaling Jaya

Yang Bahagia Profesor Madya Othman Mohd Noor, Timbalan Naib-Canselor, Universiti Malaya

Yang Bahagia Profesor Chiam Heng Keng, Pengerusi Jawatankuasa Pengelola Persidangan Kanak-kanak - Harapan Kita

Yang Bahagia Dekan-dekan Fakulti Pendidikan dan Perubatan
Dif-dif Kehormat

Tan Sri, Puan Sri, Datuk, Datin, Tuan-tuan dan Puan-puan yang dihormati sekalian

Ladies and gentlemen,

It gives me great pleasure to address you on behalf of Yang Berhormat Datuk Amar Dr Sulaiman Daud, the Minister of Education. I am speaking here not only as the Deputy Minister of Education but also as a parent. To many of us, children are precious for various reasons: they are an extension of ourselves, they are God's gift to us, they perpetuate our heritage, they are our security, they give us a sense of self-worth and so forth. Children are valuable to the society: they are the means by which the society is being perpetuated and they are the determining factor of the progress, the continued success or the downfall of a nation. I agree totally with the organisers that securing the future of the children is securing the future of the nation and mankind. How we shape our children's character and develop their potentials will determine whether they will be a productive adult or a liability to society. Consequently, when we plan our strategies to attain our Vision 2020 we cannot ignore the children of today because they will be at their prime of life in the year 2020.

Whether they are going to be a productive workforce or economic or social dependents is determined largely by the way we nurture them today. *We* in this context, does not refer to only you and I who are here in this Conference but it also includes parents, caregivers, teachers, the government and the society.

We need to examine very carefully how children are being nurtured today. The increase in drug addiction, juvenile delinquency, disciplinary problems in school, child abuse and materialistic outlook makes it imperative for us to pay greater attention to our child rearing practices and child care. If we allow the present trend to continue then there will be more dependents on the nation and more liabilities to the nation. Furthermore, preventive rather than curative measures should be taken to ensure that the current trend of increase in social problems is arrested or reduced. These preventive measures should be taken as early as possible while the child is still young and malleable. Parents, caregivers, teachers, the government and the society have important roles in ensuring that the child is nurtured in ways which not only permit the development of intellectual abilities but also the development of his/her personality and mental health. Parents, caregivers, teachers, the government and the society, each of them has his/her own unique roles and contribution. However, they have to work with one another to ensure that the children are equipped to face the future and contribute to the development and progress of the nation.

Let me address the parents first because they are the most important agent in children's development. Parents must be mentally and economically ready for parenthood. Children do not only have the right to survive but they also have the right to development. It is not enough to bring the child into the world. Parents have the obligation to ensure that the child can be given the love, care and protection. Studies on child abuse have consistently shown that, although child abuse can occur in any socioeconomic status of the society, nonetheless, child abuse is closely linked to poverty, crowdedness and the feelings of helplessness arising from the inability to cope. While poverty may be difficult to be eradicated, parents can reduce the risk by increasing child bearing age and spacing of birth.

Another vital role of the parent is the giving of equal emphasis to all aspects of development. Although it cannot be denied that knowledge and intellectual development are important to the child's future yet what good is a Ph.D degree to the child if he/she is emotionally crippled and socially inapt or psychologically unsound?

It is the recognition of the importance of promoting all aspects of development that my Ministry has revamped the primary and secondary school curriculum by introducing the KBSR and KBSM curriculum so that children are no longer evaluated on written examinations but are assessed on other qualities such as the ability to search for information, the ability to apply the knowledge, reporting skills and leadership qualities.

Let me now move on to the caregivers who are increasing in demand. As the number of maternal employment increases and as domestic help becomes more and more difficult to come by, home childminders and child care centres are not only here to stay but they will become increasingly important to the child's development as more and more parents relinquish the care of their children to care providers. It is the recognition of their importance that the Malaysian government passed the Child Welfare Act in 1985 which requires all childminders to be registered. This registration is necessary. It does not only give recognition to the childminders' role in society but it also ensures that childminders are properly trained to provide proper child care.

Before I comment on the teachers' role in children's development I would like to point out the role of the society. The influence the society has on children's development is grossly underestimated. The society's stress on or rather its obsession with intellectual development and academic achievement has flooded the market with all kinds of materials and programmes which purported to foster children's intelligence. The excessive commercialisation of children's development can injure the child permanently. For instance, a two-year-old child who is drilled to read, no matter how lovingly is done, is deprived of physical, emotional and even cognitive development. Nature has programmed the child's development so that, at the age of two years, the most crucial activities are those of the sensory and motor nature such as crawling, touching, sensing and looking. Through these activities, the child gets to know his/her environment and this knowledge forms the basis of his/her cognitive structure. Therefore, it is important for those who promote these materials or run the various types of training centres to have a good conscience, so that their monetary empire is not built at the expense of children.

Although the influence of the media is well-known many of us are not giving sufficient notice to the effects. Writers, publishers, radio and television producers and advertisers should take cognisance of their impact on children and, hence, their future.

The teachers' role in a person's development has been long acknowledged and the status which used to be accorded to teachers attests to their importance. The younger the child the greater the impact teachers have on him/her. Owing to the recognition of kindergartern's role and the realisation that kindergarten is essential to the children's development, especially in culturally deprived homes, my Ministry has recently incorporated kindergarten into the existing educational system. Until recently, kindergarten has been provided on a private basis, except for those which are under the wings of the Ministry of National Unity and Community Development or statutory bodies. As a first step to the new structure, preschool will be provided as part of the formal educational system in rural and deprived areas.

I am very happy to note that this Conference addresses both the physical and psychological aspects of development of preschool children and many of the papers are based on the research findings of the Malaysian Child Development Project. I am sure the findings and discussions will benefit my Ministry. We will examine the findings of this research closely and we hope that the knowledge of the status of the physical, intellectual, language and socio-emotional development of children in urban advantaged, urban disadvantaged, rural and estate sectors will enable us to develop programmes which will equip children with the basic skills that will prepare them for the more formal primary school.

I am pleased to observe that papers on parental involvement in child care centres are also presented. I think it is important for parents, child care providers, schools and the community to work closely. I also note that maternal employment and physical environment are areas which this Conference has acknowledged to be important to children's development. My Ministry is interested in your discussions and will study any proposals which you present to my Ministry after your three days of deliberation. This is because the primary aim of my Ministry is to provide an education that will equip children with the skills necessary for them to become productive adults. We welcome your help.

I am told that the participants come from a wide spectrum of background. We can learn much from each other - the practioners can be informed of the latest in child development while the experts can get feedback from the grassroot level as to what is practical and what is impractical. I hope everyone of you will have an enjoyable and fruitful time. To our guests from our neighbouring countries I bid you a warm welcome and hope you will be able to take some time off to see a bit of the beautiful city of Kuala Lumpur.

Dengan sukacitanya saya merasmikan pembukaan Persidangan Kanak-kanak - Harapan Kita.

Closing Address
by YAB Dr Toh Puan Aishah Ong

Yang Berbahagia Profesor Chiam, Pengerusi Jawatankuasa Pengelola Persidangan ini, Datuk-Datuk, Datin-Datin, Tuan-tuan dan Puan-puan yang saya hormati sekalian.

After conferring for three whole days and with a tightly packed programme, I am quite sure that you are mentally and physically exhausted. Though you are mentally drained through overworking your brain, I hope you are, at the same time, charged up by the new ideas which have been generated by the papers presented and the discussions which follow them. I hope that you have been so motivated by what you have learned in the last three days that you are ready to try out some of the novel ideas when the new term begins. You may have to be brave, committed and innovative because you may encounter oppositions from those who did not have the benefit of this Conference. It is important that you take up the challenge and become the catalyst for change. Unless we have people who are prepared to face criticisms and sceptisms, we will not move fast enough and adjust to the changes of today's world. I am addressing this issue, not only to kindergarten teachers, childminders and care providers but, I am also making this appeal to the experts, researchers, lecturers and trainers. They too need to follow up new hunches and go into unexplored fields.

The reports of the various workshops reveal that there are so many issues which are still unresolved. The many proposals that have been put forward as the result of the brain storming at the workshops suggest that there is so much more to child development. Instead of providing solutions to the many issues discussed at the plenary and workshop sessions, this Conference seems to open up the pandora's box. Thus, the more the questions are asked, the more the problems will surface. We, that is you and I, should not be discouraged by the problems. We should look upon them as challenges to drive us to work harder to find the solutions and to take up the cause with the relevant government bodies or agencies with vigour and persistence.

The realities which we have to accept is the increasing number of women in the workforce and day child care centre being a permanent part of the Malaysian way of life. As with regards to maternal employment, we have to scrutinise it very carefully to see how it affects the family in general and the child, in particular. We probably need to research into its effect so that appropriate solutions can be sought.

Since day child care centre is as essential to our present day living as refrigeration or any of our household appliances, several issues have to be addressed. Firstly, child care should be recognised as a profession and training must be provided for those providing the child care. At the moment, childminders are being trained by the Ministry of National Unity and Community Development while the bulk of kindergarten teachers are trained by the Persatuan Tadika Malaysia or the Association of Kindergartens, Malaysia. Perhaps, the time has come for the Ministry of Education to provide training for care providers and kindergarten teachers so that all care providers and kindergarten teachers are properly trained and certified. In fact, the most qualified personnels should be channelled to teach the very young ones and not as it is practised today - which is the most qualified teach university students and the least qualified take care of the young ones.

The universities should also recognise the importance of early childhood education and set up departments in this area to cater to this growing need and to give recognition to the importance of providing proper child care and education of the young. Most of the universities in developed countries have child development and early childhood education departments. The setting up of such departments will also encourage research in child development and its related issues. I hope the University of Malaya, with its existing facilities provided by the Child Development Centre, will take the lead.

The fact that the Malaysian Child Development Project is the joint efforts of the Faculty of Medicine and the Faculty of Education and the fact that this Conference is the outcome of their joint efforts, demonstrate very clearly the need for child development to be the concern of many disciplines. It needs the close cooperation of the psychologists, paediatricians, nutritionists, parasitologists, experts in maternal and child health, educationists, economists, sociologists, physiotherapists and speech therapists - just to name a few of them. Perhaps the time has come for the government to set up a National Child Development Centre to bring together experts from the various disciplines to take up the many child development issues: to encourage, monitor and facilitate research, to develop programmes, to train key personnels, to identify need areas and so forth. This Centre can also function as a resource and dissemination centre. This concept is not new. Many countries have child development centres and I hope the Malaysian government will give due consideration to this suggestion.

There is so much we need to do and can do to procure our children's future and also that of the nation. Time does not permit me to go on, much as I love to do so. I would like to take this opportunity to congratulate the Child Development Centre at the Faculty of Education and the Faculty of Medicine of the University of Malaya for organising this Conference which I am sure has heightened the awareness of the importance of proper care and protection of our children. I pray that the members of these two faculties will continue with their good work. God bless all of you and to those who are returning to other countries or their home towns in the other states of Malaysia, may you have a good journey home.

• Part Two •

Papers Presented

Physical Development:
Present Status and Future Objectives

J. O. Forfar
University of Edinburgh

1. Introductior

From a biological point of view, life can be divided into two phases, the period of development perhaps up to the age of 18 years, and beyond that the period of maturity and decline. These two periods are not independent parts of life. The former, almost unique to childhood, predetermines much that occurs in the latter. More and more disorders in adulthood are being traced back to childhood antecedents. The English poet Wordsworth's concept that *The child is father to the man* is not the biological contradiction which at first it might seem but rather an expression which would fit the theme of this Conference.

My task involves defining and discussing the physical norms in child development, examining the variations in normal development which can pose clinical problems and in the light of the objectives which physical norms establish looking at the disorders which may interfere with the attainment of these objectives. An understanding of the norms of growth and development and of the factor which may hinder or prevent their achievement is a prerequisite for those whose primary professional task is to seek a better future for our children.

2. Physical Growth and Development

Measurement of growth in childhood is not new. Some two and a half centuries ago, Philibert de Montbeillard, a French Count, made regular measurements of his son's height throughout childhood and published these for posterity. He demonstrated that there was a rapid rate of growth in the early months of life which diminished progressively until the 12th year when the rate suddenly accelerated again - the adolescent growth spurt - continuing at an accelerated rate for two years before falling again and ceasing at 18 years.

a) The Foetus

Development during childhood requires further consideration but important as it is, it is not in itself the complete story of development. An understanding of this involves consideration of events which preceded birth because the nine months of foetal life can profoundly affect the ultimate growth and development of the child yet unborn.

Implicit in foetal life are very rapid growth - far faster than the postnatal rate of growth - and the development of the body systems which will sustain extrauterine life. From the 15th week of pregnancy until the 40th week, the length of the foetus increases five-fold and its weight 35-fold (Table 1). At the same time, particularly in early pregnancy, organs such as the heart, lungs, brain, kidneys and so forth are undergoing major evolutionary changes as they metamorphose from a primitive state to their final complex state. Rapid growing and developing tissues, such as the foetus exemplifies, are particularly susceptible to disorders of substance and structure. The foetus is further endangered by the vulnerability of the placental mechanism which maintains its essential supply of oxygen and nutrients and the ready susceptibility of foetal tissues to toxic influences. These potential dangers to normal development, implicit in the physiology of the foetus, may express themselves in the form of congenital abnormalities, premature delivery and neurological damage, all of which can blight the achievement of satisfactory growth and development.

Table 1: Foetal Weight

Age of Foetus	Weight	Number of Times	
15 weeks	100g	x 3.5	x 35
20 weeks	350g		
30 weeks	1500g	x 10	
40 weeks	3500g		

b) Birth

Birth is a dangerous process. The change-over from a totally dependent state during intrauterine life to an independent extrauterine existence represents for the foetus a major physiological hurdle. The previously unused respiratory system has to take over the process of oxygenation, the alimentary system has to supply the newborn infant with nourishment through an entirely different mechanism using a hitherto unknown source of food, the cardiovascular system has to alter radically its pumping arrangements so that the changes in body haemodynamics necessary for extrauterine life may be effected. The delicate nature of these and other processes put them at peculiar risk. Any failure to achieve these vital changes will seriously compromise the new-born infant's potential for normal growth and development. Further, the physical nature of birth involves the risk of traumatic damage to the foetus which can manifest itself as damage to the brain or other organs.

c) Growth and Development in Childhood

Following foetal life and then birth, the third stage of growth and development, is the period of infancy and childhood.

i) Height and Weight

Postnatal growth, although slower than foetal growth, is at its maximum in the early weeks of life. An infant has doubled his birth weight by the fifth month. Fortunately he does not maintain that rate. If he went on doubling weight every five months he would weigh 200 tons by the time he reached maturity! We can chart growth both of height and weight on standard charts which indicate the range of normal growth. Such charting is of great value in interpreting the height and weight of children on a single observation basis or of detecting trends by recording measurements over a period of time. The simultaneous charting of height and weight enables the concept of weight for height and height for weight to be utilised. This comparative recording may be of considerable value in diagnosis. A hypothyroid child (cretin), for instance, is stunted in height relative to his weight.

Different organs grow and develop at different rates. There may be *critical* periods in an organ's development. The brain, for instance, on whose normal development so much of the child depends has undergone 80 per cent of its growth during the first 4 years of life and any cerebral insults at this time, such as meningitis, encephalitis or physical injury, can have a much more serious effect than they would have later on in life.

ii) Posture

Posture is subject to variation during childhood. Some bowing of the legs is normal at 18 months, knock knees at 3 years and straight legs at 6 years. Mothers may worry unnecessarily about these early postural changes.

iii) Sex Differences

Girls mature earlier than boys with an earlier adolescent growth spurt so that there is a short period in life, usually between 11 and 14 years, when their average height and weight are greater than in boys. During this short period, girls are physically advantaged relative to boys.

iv) Adolescent Growth Spurt and Sexual Maturation

All children do not grow at the same rate. The time of onset of the adolescent growth spurt can vary by four years (Table 2) and the same variation can be seen in sexual maturation. A 14-year-old boy who is physically stronger and sexually more mature than a more slowly developing classmate of the same age may seek to dominate him and even bully him and the immature boy may suffer psychological trauma in consequence. Nature's variations in the rate of development may create childhood problems.

Table 2: Sexual Development Years

Type of Development	Years
Growth spurt	9.5 - 14.5
Menarche	10.0 - 16.5
Breast enlargement commences	8.0 - 13.0
Breast enlargement completed	13.0 - 18.0
Penile enlargement commences	10.5 - 14.5
Penile enlargement completed	12.5 - 16.5
Testicular enlargement commences	9.5 - 13.5
Testicular enlargement completed	13.5 - 17.0

d) Ethnic Differences

Growth variations are evident between different races. The seven feet tall Senussi tribesmen of Africa and the four feet tall Pygmies of South America represent extremes of ethnic variation. Tables 3 and 4 show some of the figures obtained on examining different racial groups. In Singapore, Professor Wong found that Chinese children were taller than Malay children but the former are smaller than British children who in turn are smaller than American children, black or white. Another factor enters into these comparisons, namely nutrition. In Britain, Scottish children, reared perhaps in a more frugal environment than their English counterparts, fall behind them in stature as childhood advances. Black children in the United States of America are much taller than black children from the West Coast of Africa from where the black population of America originated. There is good evidence that sub-optimal nutrition plays a part in many ethnic variations.

Table 3: Ethnic and Cultural Differences in Height (cm) of Males

	Age (Years)						
	2	4	6	8	10	12	14
Country							
Singapore							
Malay	82.5	95.0	107.2	117.5	126.7	135.2	145.3
Chinese	85.9	98.5	111.0	120.0	129.5	138.2	149.5
Britain							
London	85.9	101.6	114.6	126.2	136.8	147.3	160.7
Edinburgh	86.2	102.0	112.4	123.7	133.3	144.7	156.0
USA							
White	87.5	103.4	117.5	130.0	140.3	149.6	162.7
Black	86.8	102.2	116.8	128.0	137.2	150.7	162.5
Africa							
West Coast	77.5	92.7	109.5	119.5	128.5	137.0	148.5

Table 4: Ethnic and Cultural Differences in Weight (kg) of Males

	Age (Years)						
	2	4	6	8	10	12	14
Country							
Singapore							
Malays	10.5	13.9	16.7	20.0	24.0	29.0	35.0
Chinese	11.4	14.5	18.0	21.0	25.0	30.0	36.8
Britain							
London	12.7	16.6	20.5	25.0	30.3	37.7	48.8
Edinburgh	12.6	16.7	20.0	24.5	28.9	35.2	44.0
USA							
White	13.0	16.1	20.0	26.5	32.6	40.5	53.4
Black	13.0	17.0	22.3	26.1	31.7	40.5	52.0
Africa							
West Coast	9.5	13.6	18.8	23.0	28.7	33.5	41.2

e) The Secular Trend

In his classical work, *The Origin of Species,* Darwin showed that over a time scale, measured in thousands of years, nature evolves and changes different species. Even over a time scale measured in decades, the species of man, homo sapiens, can be shown to change. Measurements of schoolboys in certain long established schools in England have shown that over the past century the average height of certain groups has increased by up to ten centimetres. A similar trend has been the age of the menarche, which in many European countries since the middle of the last century, has fallen from 16 to 13 years. This implies sexual maturation at an earlier age with the problems which that poses. Teenage pregnancy, because of the age of the mother and her tendency to avoid antenatal care, imposes greater risk to the infant in terms of ultimate development than pregnancy at a more mature age. Teenage pregnancies have become a significant problem in many developed countries.

f) Motor Development

Physical development is not merely a question of height, weight and sexual maturation. It also concerns achievement of motor function. Assessment of motor function in early life provides an important index of a child's physical and neurological well-being. This assessment is usually based on milestones of development, a scale of classified motor performance achievements at various ages related to competence in movements which lead ultimately to the ability to crawl, sit and walk. Later in life, motor development can be measured in other ways such as measuring muscle strength and assessing physical achievements.

g) Energy and Calorie Requirements

In considering the physiological aspects of physical development, there is another very important consideration, namely energy requirements. Fuel in the form of food is required for growth. If there in not enough fuel, first physical activity diminishes, then growth slows up and ultimately ceases. Men engaging in arduous work require a higher calorie intake than women who are not so engaged and this has led to the erroneous belief that at all ages males require a higher calorie intake than females. In childhood, girls and boys require the same calorie intake up to the age of 10 years (Table 5). Girls must not be discriminated against. As the World Health Organization has said of girls, "The health of the next generation depends on them: a girl who grows into a healthy confident and strong woman has a much better chance of safe motherhood and of raising her children, male and female, to full potential". Whether the male chauvinists like it or not, the biological well-

Table 5: Daily Calorie Needs of Males and Females

Age (Years)	Male	Female
1 - 3	1300	1300
4 - 6	1800	1800
7 - 10	2400	2400
11 - 14	2800	2400
15 - 22	3000	2100

If adolescent or adult females are engaged in hard physical work their needs will be similar to those of males.

being of each generation of males is dependent on the biological well-being of the preceding generation of females.

3. Obstacles to Normal Growth and Development

The norms of physical growth establish the standards which we seek to achieve for all our children. Sadly, we have to recognise that many children fall short of established norms of physical growth and development. Why is it that some children are thus disadvantaged and what can we do about it?

The major obstacles to the achievement of normal physical growth and development can be identified under four general headings, namely harmful biological inheritance, adverse environmental circumstances, socioeconomic disadvantage and unfavourable personal life experience.

a) Harmful biological inheritance

i) Genetic

Much of what we are is a reflection of the genetic make-up of our ancestors, particularly our parents. At conception, the embryo has a 50/50 chance of acquiring any adverse gene which either parent possesses. We are gradually learning more and more about the subtleties and deceptions of nature's play in the genetic card game although our knowledge of this is as yet far from complete. Potentially harmful genes dealt from the inheritance pack may be discounted for a variety of reasons and their recipients suffer no ill effects. In other instances, sometimes predictably sometimes unpredictably, the harmful potential of gene is fulfilled and serious developmental abnormality results. While it may be possible in the future to introduce healthy genes to offset the effect of harmful genes where these are present and are causing disease, gene therapy of this type is not yet possible.

Genetic counselling, based on the knowledge we currently possess, can at least inform some parents of their genetic risk in respect of children and allow them to make informed decisions.

For some genetically determined disorders, it is possible to counter the adverse effect of abnormal genes. Examples would be the administration of anti-D immunoglobulin where Rh incompatability in the parents' blood groups carries a threat of a celebrally palsied deaf child; a diet low in phenyl alanine in an infant suffering from phenylketonuria who would otherwise suffer serious mental retardation; and the avoidance of certain foodstuffs and medications so as to obviate the *triggering* effect which these may have in glucose-6-phosphate dehydrogenase, a disease which can cause severe episodes of jaundice and anaemia. Genetic manipulation of this sort is often the best that we can do to prevent the developmental disturbance which might otherwise result. Unfortunately, only a few genetic disorders lend themselves to this form of treatment.

For many genetic disorders, the unavoidable fate of the affected child is serious developmental failure, physically and mentally. Modern technology can now identify in early pregnancy many foetuses doomed to suffer in this way. Thus, early termination of pregnancy can be relatively easily and safely carried out, often with the prospect that in a subsequent pregnancy the harmful gene may not be transmitted from foetus due to the 50/50 chance or transmitted in a way which renders it innocuous. Under these circumstances, there are many who are willing to accept the option of termination and many who are not.

ii) Chromosomes

Genes are carried on chromosomes, 46 in the nucleus of every cell in the body except for the sex cells which have 23. Chromosome abnormalities of number or form can occur at conception with resulting serious development abnormalities. Down's syndrome and Turner's syndrome are examples of such. For many chromosomal disorders, medicine has little to offer other than symptomatic support or therapeutic abortion on recognition of such a defect early in pregnancy by screening techniques.

b) Adverse Environmental Circumstances

i) The Prenatal Environment

Maternal disorders such as pre-eclamptic toxaemia, diabetes mellitus and AIDS can clearly damage the foetus. For some of these maternal disorders, therapy for the mother is also therapy for the unborn child.

From the standpoint of avoidance, however, it is the self-induced intrauterine insults resulting from smoking, alcohol and drugs which merit particular attention. Smoking adversely affects growth of the foetus. Alcohol can cause congenital abnormalities. Both can be avoided. Drugs of addiction such as heroin, cocaine and amphetamine can harm the foetus as well as the mother taking them. Therapeutic drugs are in a different category. As a general rule, they should be avoided during pregnancy unless there are clear and valid reasons for taking them. It is in the early weeks of pregnancy that the foetus is most vulnerable. Thalidomide, singularly safe in other ways, can cause profound foetal damage if administered at this time. Many drugs, such as antibiotics, are safe in pregnancy but dilemma arises when a drug which carries a small risk of impairing foetal development is necessary for the mother. Some of the anti-epileptic drugs come into this category. If withheld, the fits which the mother may experience may not only harm her but the foetus as well. In such circumstances, the admininistration of such drugs is likely to be the lesser of the two unavoidable risks.

ii) Birth

The transition at birth from foetal to postnatal environment is potentially damaging to the infant and demands competent obstetric management. Lack of the latter can affect the future of the infant in two ways. The infant may suffer directly but if the mother suffers and dies in childbirth, as happens to 1 in 20 mothers in certain parts of the world, the loss to the infant of his/her primary care can be profoundly prejudiced to his/her future development

iii) The Postnatal Environment

The world is finite and the environment which it provides for the population who inherit it will sustain only a limited number of human beings. World population is increasing at an alarming rate (Table 6). In too many countries the available environmental resources are insufficient to maintain populations at an economic and nutritional level adequate for the healthy growth and development of their children. If the world does not control its population, nature will do this for it by the unpleasant expedient of starvation, poverty, the diseases which thrive on these, and a

Table 6: World Population

	1950	(%)	2000	(%)	X Factor
Total	2517		6675		2.5
Asia	1381	(55)	3994	(59)	3.0
Europe	572	(23)	963	(15)	0.7
Africa	222	(9)	720	(11)	3.3
N. America	166	(7)	345	(5)	2.0
S. America	163	(7)	667	(10)	4.0
Oceania	13	(<1)	36	(<1)	3.0

Table 7: Height (cm) of Stuttgart School Children

Age (Yrs)	1940	1945	1950
7 - 8	126	123	125
11 - 12	143	139	143
14 - 15	166	165	168

heavy toll on childhood development. Even in stable, relatively affluent populations, such as those in Europe, a family size greater than three means that by the time the later children reach the age of 7 years, they are smaller than their elder siblings at similar age. This phenomenon is seen in all social classes.

Nature seeks to protect the foetus, even at the expense of the mother, and maternal malnutrition has to be severe to affect the foetus. In the postnatal environment, however, infant and child are very susceptible to nutritional deprivation. On a worldwide scale, the greatest threat to growth and development in our children is probably malnutrition. UNICEF estimates that 36% of the world's children under the age of five suffer from malnutrition, a situation which television now brings starkly to the notice of most of the countries. Even moderate undernutrition affects growth. During the Second World War, there was moderate undernutrition in Germany which affected the height of school children as shown in studies carried out in Stuttgart (Table 7).

Malnutrition may be general or selective. In kwashiorkor, deficiency of protein is the major deficiency, in rickets it is Vitamin D. Early remedial treatment of malnutrition is effective while undue prolongation is likely to result in permanent effects.

Children are peculiarly prone to *accidents*. In many countries, after the period of infancy has passed, accidents to children are the commonest cause of death. In Britain 10,000 children each year suffer a permanent effect of some sort as a result of an accident and 3% of all childhood accidents admitted to hospital result in permanent disability due to brain damage. The motor car and other manifestations of the technological age exact a high price from children.

c) Socioeconomic Disadvantage

The wealth of a nation and the health of its people show some degree of correlation but good economic and health planning can enable a nation with a moderate gross national product (GNP) to equal the health standards of one with much higher GNP. Children are the primary sufferers when national economies are disrupted or impoverished by bad government, when wars or evil dictatorship empower and enrich the few and disenfranchise and impoverish the many, when law and order breakdown or civil strife erupts. Likewise, natural disasters, such as floods and crop failures, may lead to starvation and diseases. In the developed countries, it has been shown that adverse socioeconomic circumstances as measured by single parenthood, poverty or overcrowding result in shorter stature and other evidence of disordered development.

d) Unfavourable Personal Life Experience

A healthy lifestyle for children requires an adequate diet, appropriate clothing and housing, play and relaxation, physical exercise, freedom from fear and abuse and caring, loving parents.

i) Disease

Children affected by long-term disease are all too frequently impaired in growth and development. Many diseases can be involved. In broad categories, these include neonatal disorders, chronic infections, endocrine, cardiovascular, gastro-intestinal, neurological and metabolic disorders.

ii) Child abuse

Child abuse, physical or sexual, usually has a serious affect on a child's development. So too may the subtler abuse of psychological neglect or undue emotional stress.

iii) Child labour

Excessive child labour is damaging to the health of the children. The recent WHO report that Malaysian girls aged 5-6 years work 75% more hours than boys of the same age, if true, must be a matter of concern in this country.

iv) Lack of Education

Education has a vitally important role in the achievement of a healthy life style. The more girls are educated, the better is their own nutritional status and that of their offspring, the lower their birth rate when they reach adulthood and the greater the chance that their fewer children will achieve optimal growth and development.

Health education is, or should be, part of the educational process. It is not the province of a few doctors. It is more effective when it is included as an integral part of a school curriculum and is provided by the teachers who normally teach the children. For this task, teachers require training.

4. The Objective

Recognition of the norms of physical growth and development and of the obstacles which can deprive children of the capacity to achieve these norms leads inevitably to a consideration of the means by which these obstacles can be overcome. This is no easy task. There are no quick solutions. There is little hope of dramatic successes and because of the nature of some of the problems, there has always been the prospect that the situation will worsen before they improve. Though the task is difficult, we shall achieve nothing unless we seek to define it and constantly keep before us the objectives which we should try to reach if more and more of our children are to enjoy healthy, happy childhoods as a prelude to taking their place as adults capable of carrying the burden of responsibility which adulthood imposes and any nation requires of its citizens. In broad categories, these objectives could be defined as follows:

Population sizes to be regulated so that they do not exceed the environmental resources available to sustain them.

The alleviation of poverty to receive high priority and national agricultural programmes to be promoted.

No discrimination regarding sex, race or religion.

Special health care for mothers-to-be including preventive measures, adequate diet, rest and good obstetric care.

The caring supportive role of the family to be encouraged.

All children, male and female alike, to be adequately nourished with no discrimination on account of sex, race or religion.

Children to be adequately clothed and housed, to receive water safe to drink and to live in sanitary conditions.

Child abuse and neglect of all sorts and harmful child labour to be outlawed.

Children to be given appropriate opportunities for play.

> Education for all children including girls to have a high priority. Health education to be promoted for all parents and children.
>
> Children to benefit from early diagnosis of childhood disease and disorder, with an effective primary health and preventive service in the community and a hospital service geared to the needs of children.
>
> Immunisation programmes to be established and their implementation ensured.
>
> Special provision to be made for handicapped children so that they may fulfil whatever potentials they have.
>
> World action to achieve the absence of war, political turmoil and repressive political regimes.

Clearly the achievement of these objectives will involve a wide range of organisations including international organisations, governments, social services, education authorities, medical organisations and people, including politicians, doctors, teachers, social workers, administrators and the public. Since child development is a national problem of such importance it has to require a high place on the political and public agenda of any nation. But, little is likely to happen unless there is wide understanding of the problems it presents and a national will to solve them. In creating that understanding and will, and the climate of concern necessary, those whose primary interest is in children have a vital role to play, both within the strict confines of their own professional discipline and outside these confines. The latter role is that of advocacy, of constant promotion of children's rights and needs, of explanation, interpretation and persuasion based on the knowledge, expertise and experience which those with professional training and practice in the field of child development and child health possess. In striving towards the attainment of these objectives in Malaysia, all those who are attending this Conference have, I am sure, an important part to play.

Physical Growth

Chen Siew Tin
University of Malaya

1. Introduction

A child's growth achievement depends on his genetic endowment and the environment in which he lives. Comparative studies of children of different races, growing under similar environmental conditions, have shown that population differences in body size and shape exist. For example, Eveleth and Tanner (1976) in their worldwide comparison of body size, concluded that Afro-American children growing up under favourable conditions are a little taller and heavier than Europeans and Euro-Americans living in the same cities. This is partly or wholly because they are a little more advanced in maturity. Asians, on the other hand, under equally favourable circumstances, are smaller despite being still further advanced in maturity.

Comparative studies of children of similar racial origin but growing under different environmental conditions have shown differences in their body size and shape. Among the more important environmental influences on growth are nutrition, disease and socioeconomic status. Most of these, when analysed, are seen to be directly or indirectly related to nutrition.

This paper attempts to look at the influence of genetic factors on the growth of children by looking at sex differences and also by comparing the growth achievement of a group of 126 privileged Malay children with children of other countries. It also looks at the influence of environmental factors on the growth of children by comparing the growth achievement of Malaysian children living under different environmental conditions and at different time periods.

2. Methology

For the purpose of comparison, six main growth studies of Malaysian children will be used, namely:

2.1 Chen's cross sectional study of 3,312 Malaysian primary school children (1,584 boys and 1,728 girls), aged 6 to 11 years of Malay, Chinese and Indian origin and from different socioeconomic background living in Petaling Jaya and Kuala Lumpur, 1972.

2.2 Chen's longitudinal study of 686 six-year-old primary school children (300 boys and 386 girls) of Malay, Chinese and Indian origin, from different socioeconomic background and followed-up in schools in Petaling Jaya from 6 to 12 years of age (1969 to 1975).

2.3 Chen's longitudinal study of 227 Malaysian children (106 boys and 121 girls) of Malay, Chinese and Indian origin, from different socioeconomic background, born between 1968 and 1973 and followed-up in the University Hospital Child Health Clinic, Kuala Lumpur from birth to six years of age.

2.4 Chen's longitudinal study of 126 Malay children (65 boys and 61 girls) from higher income families, born between 1975 and 1976 and followed-up in the University Hospital Child Health Clinic, Kuala Lumpur from birth to six years of age.

2.5 Chen's longitudinal study of 238 Malaysian children (126 boys and 112 girls) of Malay, Chinese and Indian origin, from different socioeconomic background, born between 1980 to 1985 and followed-up in the University Hospital Child Health Clinic, Kuala Lumpur from birth to five years of age.

2.6 Malaysian Child Development Study (MCDS): A longitudinal study of 3099 three to six year old Malaysian children of Malay, Chinese and Indian origin, from different socioeconomic background and living in Kuala Lumpur and urban and rural areas of Selangor, 1987-1990.

Physical growth is assessed in terms of body size: weight, length/height, head circumference, left mid-upper arm circumference; body shape or proportion: crown-rump length/sitting height and leg length and body fat: left triceps skinfold thickness. The techniques of measurement used are based on those of Falkner (1960) and Jelliffe (1966).

3. Influence of Genetic Factors on Growth

3.1 Sex Differences

3.1.1 Observation

Figure 1 shows the mean curves of weight, length, crown-rump length and leg length of the 65 boys and 61 girls (study 2.4) from birth to six years of age. It can be seen that, in the average, boys are heavier and taller than girls with longer crown-rump lengths and leg lengths.

Figure 2 shows the mean curves of head circumference of these children. It shows that boys, on the whole, have bigger head circumference than girls from birth to six years of age. Figure 3 shows the mean curves of left mid-upper arm circumference and left triceps skinfold of these boys and girls. On the whole, boys have slightly bigger arm circumference than girls (not significant after 18 months of age). The left triceps skinfold curves of boys and girls are superimposed during the first two years of life after which the girls have more fat than the boys.

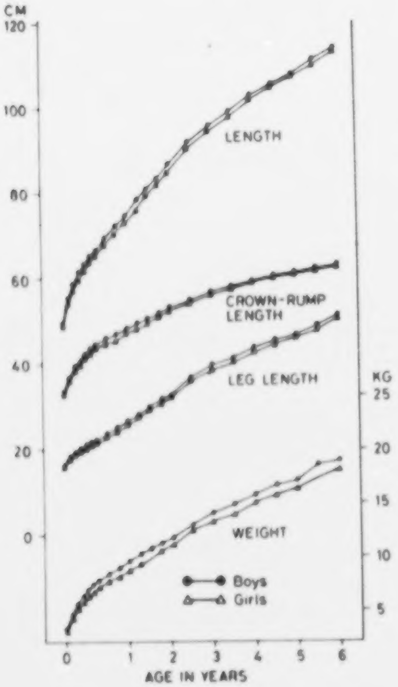

Fig 1: Means of Weight, Length, Crown-Rump Length and Leg Length of Boys and Girls from Birth to Six Years of Age

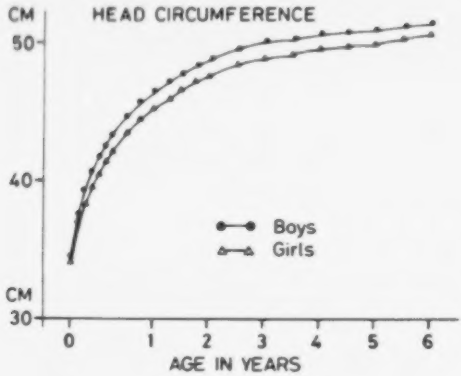

Fig 2: Head Circumference Means of Boys and Girls Aged from Birth to Six Years

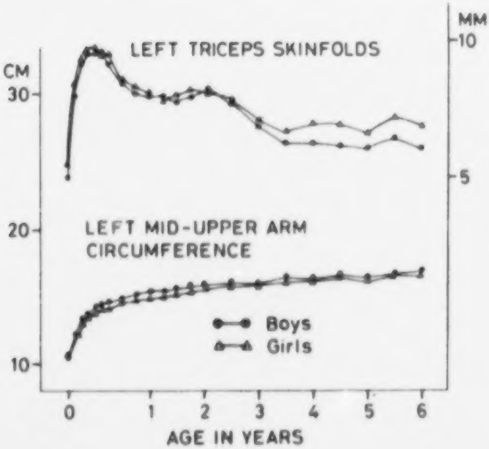

Fig 3: Means of Left Triceps Skinfold and Left Mid-Upper Arm Circumference for Boys and Girls from Birth to Six Years of Age

Figures 4, 5 and 6 show the mean weight, height, head circumference, left mid-upper arm circumference and left triceps skinfold curves of boys and girls (MCDS study) from three to six years of age.

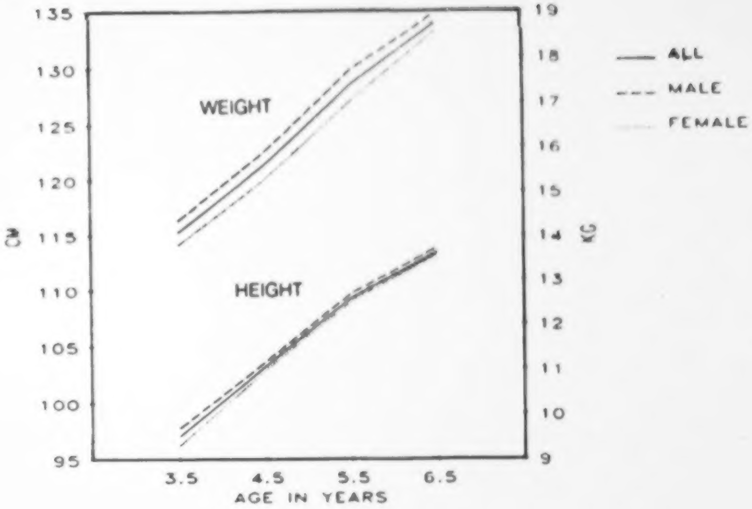

Fig 4: *Mean Height and Weight Curves of Children*

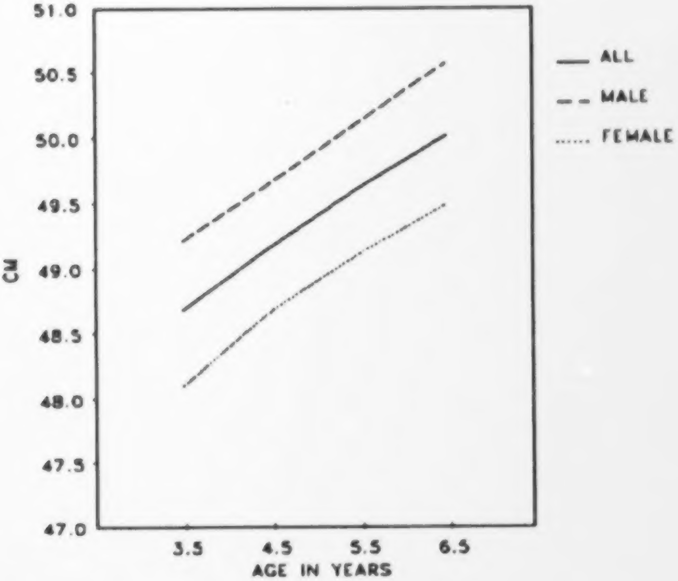

Fig 5: *Mean Head Circumference Curves of Children*

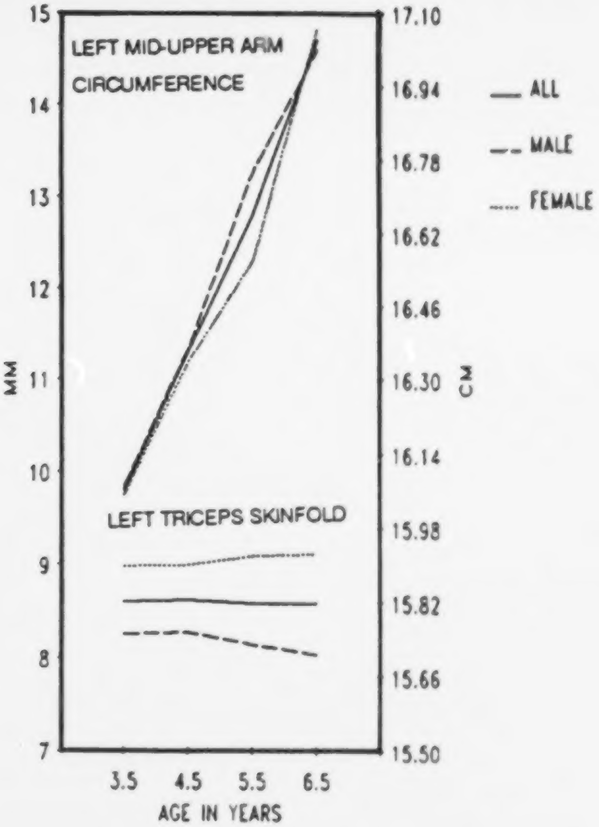

Fig 6: Mean Left Mid-Upper Arm Circumference and Triceps Skinfold Curves of Children

The study confirms the earlier study that boys, on the whole, are heavier, taller and have bigger head circumference and slightly bigger arm circumference than girls. They, however, have less body fat than girls.

Studies among school children (studies 2.1 and 2.2) also show that boys, on the whole are heavier, taller and have bigger head circumference than girls but have less body fat from six to eleven years of age.

3.1.2 *Discussion*

Our studies confirm the results of various studies throughout the world. For example, in Asia, Chang et al. (1965), Millis (1954 and 1957), Shanghai Child Health Care Co-ordinating Group (1975), and Terada and Hoshi (1965) found that male infants and preschool children are heavier and taller than females among Hong Kong Chinese, Singaporeans, Chinese in China and Japanese. In Europe, Eveleth and Tanner (1976) concluded that in every country in Europe, boys are taller than girls until the adolescent growth spurt. Meredith (1971a and 1971b), in a comparative study of children on a worldwide basis, concluded that within a particular racial and regional group, boys are generally heavier and taller than girls during infancy and have bigger head circumference from birth to early adulthood. Tanner and Whitehouse (1962 and 1975) found that, after the first year of life, British girls became fatter than boys from aged one to seven years.

3.1.3 *Conclusion*

Thus the basic difference between boys and girls during infancy and childhood seems to be that of a bigger body size in boys due to a predominance of musculo-skeletal tissue since body weight is the sum total of fat, muscles and bones.

3.2 *Comparison Between Malaysian Children and Children of Other Countries*

Study 2.4 is compared with the longitudinal study (Baber et al., 1974) of Hong Kong Chinese children of mixed income and with studies of children of European ancestry, namely European (Jelliffe, 1966), American (Nelson, 1964) and British (Tanner, 1973; Tanner et al., 1966).

3.2.1 *Observation*

Body Size:

Weight

Figures 7 and 8 compare the mean/median weight curves of the elite Malaysian boys and girls of the present study with those of the British and Hong Kong boys and girls. At birth, the average British boy and girl were heavier than their Malaysian counterparts. However, the average Malaysian boy and girl gained weight more rapidly and became as heavy as the British children till five months of age when the Malaysian children again became progressively lighter with increasing age. On the other hand, the average Hong Kong boy and girl were consistently less heavy than the Malaysian children from birth to three years of age.

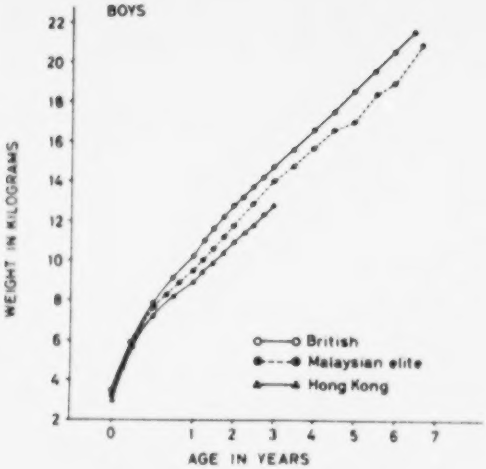

Fig 7: Weight Means/Medians of Malaysian, Hong Kong and British Boys

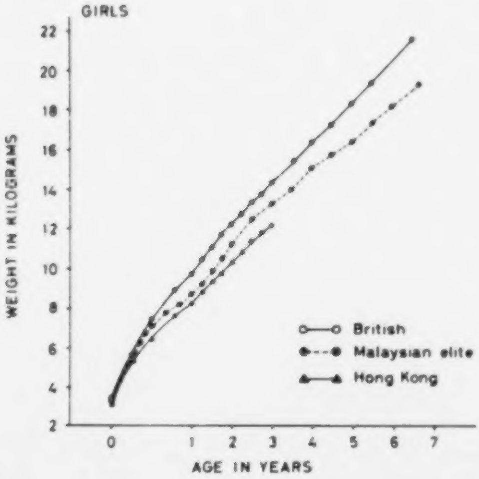

Fig 8: Weight Means/Medians of Malaysian, Hong Kong and British Girls

Length

Figures 9 and 10 show the mean/median length curves of American, Malaysian and Hong Kong boys and girls. At birth, the average Malaysian boys and girls were shorter than their American counterparts. But the average Malaysian children grew rapidly and became as tall as the average American children till nine months of age in boys and six months of age in girls when the Malaysian children became progressively shorter with age. The average Hong Kong boy and girl, on the other hand, were consistently shorter than the Malaysian children from birth to three years of age.

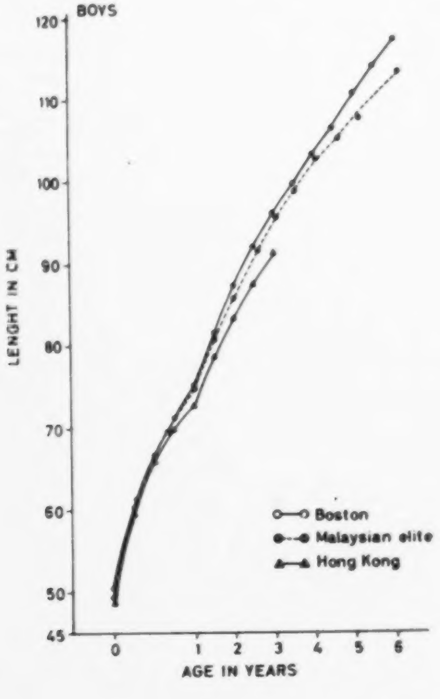

Fig 9: Length Means/Medians of Malaysian, Hong Kong and American Boys

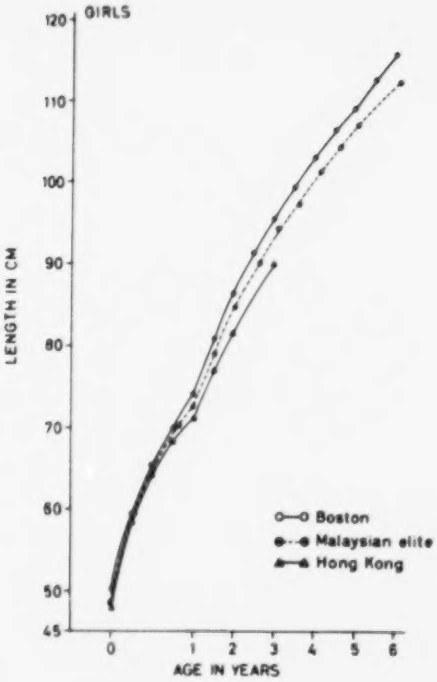

Fig 10: Length Means/Medians of Malaysian, Hong Kong and American Girls

Head Circumference

Figures 11 and 12 compare the head circumference mean/medians of the Malaysian, British and Hong Kong boys and girls. The British children had the largest head circumference, Hong Kong Chinese the smallest while Malaysian Malays were intermediate.

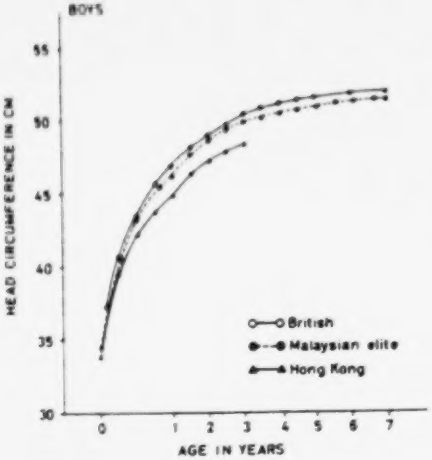

Fig 11: Head Circumference Means/Medians of British, Hong Kong and Malaysian Boys

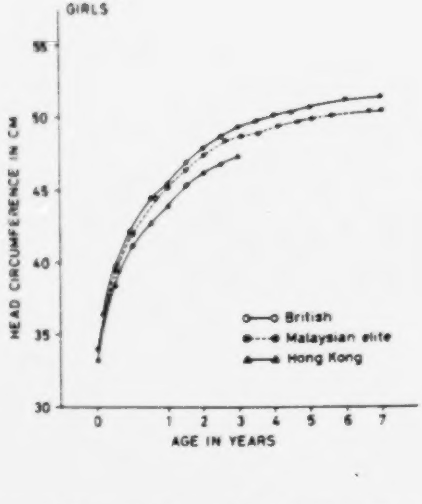

Fig 12: Head Circumference Means/Medians of British, Hong Kong and Malaysian Girls

Left Mid-Upper Arm Circumference

Figures 13 and 14 compare the left mid-upper arm circumference means of the Malaysian, Hong Kong and Wolanski's Polish children (Jelliffe, 1966). There is a directional indication that arm circumference means of the European boys and girls were bigger than those of Malaysians from six months of age. However, arm circumference means of the Malaysians were consistently bigger than those of the Hong Kong Chinese.

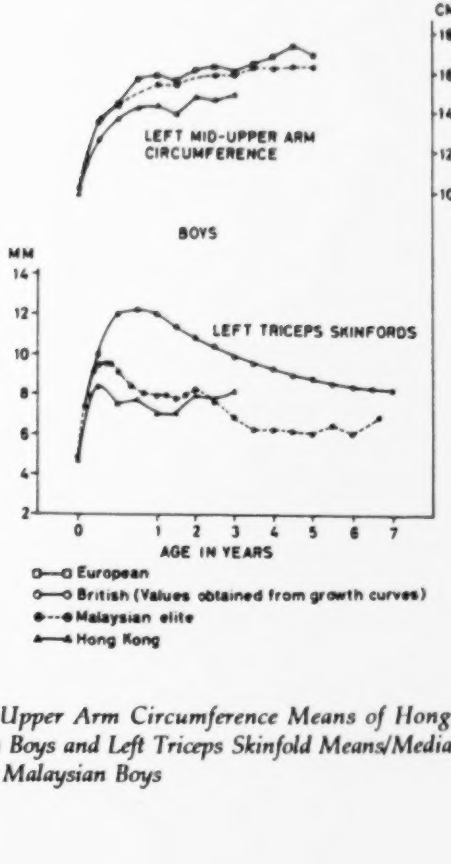

Fig 13: *Left Mid-Upper Arm Circumference Means of Hong Kong, Polish and Malaysian Boys and Left Triceps Skinfold Means/Medians of British, Hong Kong and Malaysian Boys*

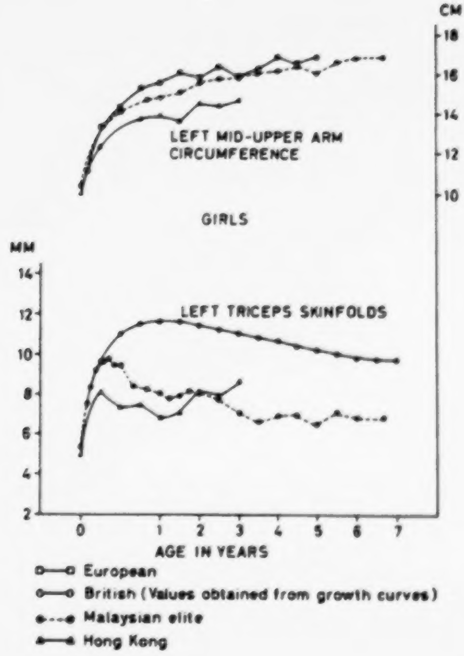

Fig 14: *Left Mid-Upper Arm Circumference Means of Hong Kong, Polish and Malaysian Girls and Left Triceps Skinfold Means/Medians of British, Hong Kong and Malaysian Girls*

Body Proportions

Crown-rump Length and Leg Length

Figures 15 and 16 compare the crown-rump and leg length means/medians of the Malaysian boys and girls with those of British and Hong Kong children. It is interesting to note that the figures show a directional indication that the crown-rump lengths of the average Malaysian boy and girl were consistently slightly longer than those of the British from one month to two years of age. On the other hand, the leg lengths were, in general, much shorter than those of the British. The growth of crown-rump and leg lengths of the Hong Kong children were very similar to that of the Malaysians, except that they were shorter.

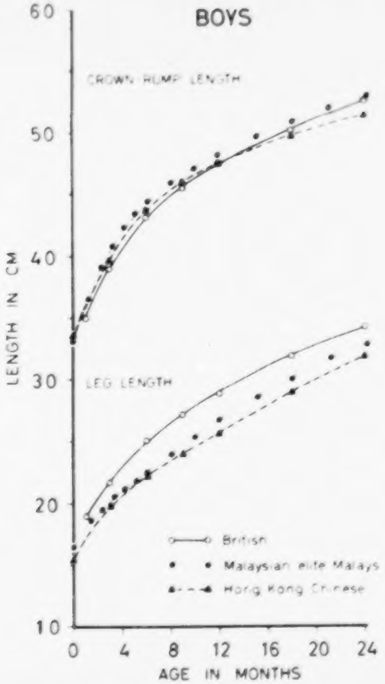

Fig 15: Crown-Rump Length and Leg Length Means/Medians of Malaysian, Hong Kong and British Boys

Leg Length for Crown-rump Length

In Figures 17 and 18, the crown-rump length means/medians at successive ages from birth to two years (British from one month of age) were plotted against the corresponding leg length means/medians for the British, Malaysian and Hong Kong boys and girls. It can be seen that the British children had relatively longer legs compared with the Malaysian and Hong Kong boys. For example, at a crown-rump length of 40 cm, the British boys had leg lengths averaging 22.5 cm, while the Malaysian and Hong Kong children had 20 cm.

Thus, although Malaysian boy and girl were shorter than their British counterparts, yet their crown-rump lengths were longer than those of the British during the first two years of life. The difference in stature between the two races is, therefore, due to the difference in leg lengths, British children having relatively longer legs than Malaysian or Hong Kong children.

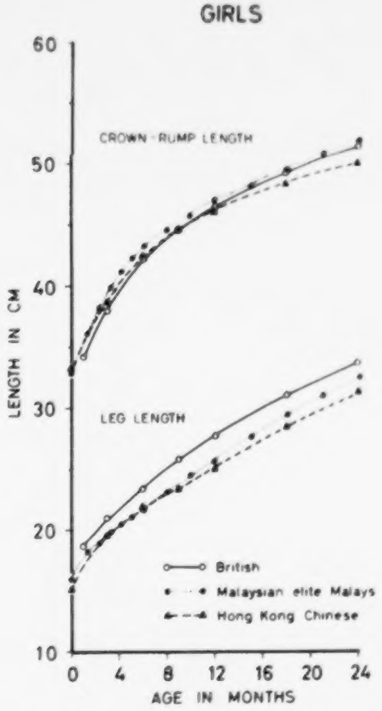

Fig 16: Crown-Rump Length and Leg Length Means/Medians of Malaysian, Hong Kong and British Girls

Body Fat

Left Triceps Skinfold Thickness

Figures 13 and 14 compare the triceps skinfold means/medians of the British, Hong Kong and Malaysian boys and girls. It can be seen that the three curves in each of the figures are different. Initially, the Malaysian and the British curves are similar till about three months of age when the Malaysian curves of both sexes reach their peaks while the British curves continue to rise and reach their peak at about six months in boys and twelve months in girls, so that the Malaysian peaks at the 50th percentile are 2 mm lower. From about five months of age, the Malaysian curves begin to decline and flatten off from about ten months onwards. The duration of peaking among the British children was much longer, lasting for about six months in boys and one year in girls, before declining. Thus, at one month of age the British and Malaysian children's skinfolds were similar while at one year of age the skinfolds of Malaysian children were

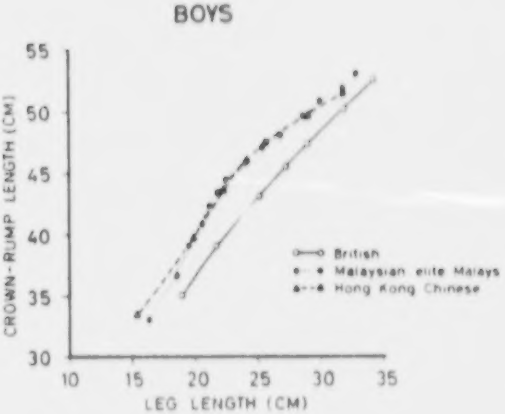

Fig 17: *Crown-Rump Length Means/Medians at Successive Ages Plotted against the Corresponding Leg Length Means/Medians of British, Hong Kong and Malaysian Boys*

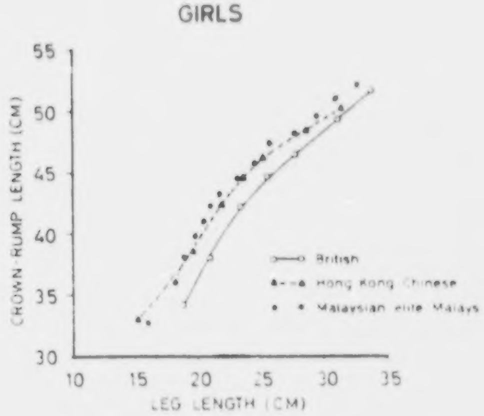

Fig 18: *Crown-Rump Length Means/Medians at Successive Ages Plotted against the Corresponding Leg Length Means/Medians of British, Hong Kong and Malaysian Girls*

smaller by 4 mm for boys and 3.5 mm for girls. The triceps skinfold means of Hong Kong children were consistently lower than those of the Malaysians from birth to two years of age after which the Hong Kong means became higher. However, the slopes of the curves of both ethnic groups are similar during the first two years of life.

3.2.2 Discussion:

Differences Between Growth of Malaysian and Hong Kong Children

The average Malaysian boy and girl in the present series were heavier, taller, had bigger head and arm circumferences and more body fat than the Hong Kong children. However, the body proportions of these two groups of children were similar. Chen, in her previous studies (1976 & 1983), had shown that upper income Hong Kong school-aged girls were taller than their Malaysian counterparts while the average Hong Kong preschool children were heavier than the less privileged Malaysian counterparts. Thus, the difference in growth achievement between the Malaysian and Hong Kong children is probably due to differences in socioeconomic backgrounds of the children rather than genetic differences.

Differences Between Growth of Malaysian and Caucasian Children

The growth of Malaysian and Caucasians was different during the first six years of life. At birth, the average elite Malaysian boy and girl were less heavy, shorter in stature and had smaller head circumferences than Caucasians. However, Malaysians grew rapidly and were as heavy and tall with similar arm circumferences and body fat as Caucasians till about five to six months of age when they again became increasingly lighter and shorter with smaller head and arm circumferences and less body fat. This pattern of growth is similar to that of lower income children growing up in poor environments in different parts of the world.

However, the elite Malaysian children in Chen's study (1983) did not grow up in poor environments but grew up in good home environments, received good nutrition and adequate care and were in good health. Yet their growth achievement, except for crown-rump length, was poorer compared with that of their counterparts of European ancestry. It is possible that the smaller size of the Malaysian children at birth is due to the effects of the poor environment experienced by their mothers during childhood as effects of poor environment are felt from one generation to the next. This is also evidenced by the catch-up growth of the infants during the first three months of life. Tanner (1981) suggested that the catch-up growth is a normal phenomena during infancy, when a reassortment of relative sizes amongst children comes about, namely, babies with genes making for large size, but born to small mothers, move upwards through the centiles and babies born large, but with genes making for small adult size, slide gently downwards. On the average, the parents of the present series were shorter by about 10 cm compared with the average British man and woman, the mean heights being 166.6 and 154.3 cm respectively for the Malaysian fathers and mothers and 176.8 and 163.6 cm respectively for the British men and women.

It is also possible that, although the Malaysians were economically well-off, their weaning diet might not be similar to that of children of European ancestry, since they are culturally different and culture often determines the type and quantity of food consumed. The meaning of food may be different in different cultures. For example, in the Malay culture, rice is considered an essential food, necessary for survival; animal protein foods are considered important for strength, and perhaps health; vegetables and fruits, however, seem not to be considered as foods but as taste additives, not essential to the diet, but pleasant to the taste. Consequently, the traditional Malay meal consists of a main dish, which is usually rice with a few side dishes consisting of animal protein and vegetables that are highly spiced. The side dishes are there to encourage a greater consumption of rice. Consequently, the traditional Malay diet is high in carbohydrate and relatively low in protein.

Whitehead & Paul (1988), in their study of British babies in Cambridge, showed similar *flatering* of growth in weight, length and arm circumferences after three to four months of infancy compared with NCHS growth curves. Those babies also had less body fat compared with Tanner Revised Standards. They attributed these differences to changing infant feeding pattern in Britain. Thus, it is likely that differences in dietary pattern may account for some of the differences in growth achievement between Malaysian and Caucasian children.

It is recognised that the differences between the size and shape of people are due to differences in their gene pools, in their environment and in the interactions between the two. Comparative growth studies of children of different races growing under similar environmental conditions have shown that population differences in body size and shape exist. For example, the studies of Ashcroft & Lovell (1964) and Ashcroft et al. (1966) in Jamaica showed that children of African, Afro-European and European ancestry were similar in size but were considerably bigger than Chinese of the same economic class. They suggested that Chinese are smaller for racial reasons. Ashcroft et al. (1968) in their study of Guyanese infants found that African infants grew faster and weighed more at all ages although their mortality experience was greater, suggesting that Africans have a greater potential size than East Indians as a result of inherited factors. Budy and Mi (1978) in their study of Caucasian, Hawaiian, Chinese, Filipino, Japanese, Puerto Rican and Korean children in Hawaii concluded that Caucasians and Hawaiians are taller and heavier than the Oriental group at a given age and class. Similar findings were noted among well-off children in Japan, Taiwan, Hong Kong and Orientals living in California, Brazil and San Francisco (cited by Eveleth, 1978a). Eveleth & Tanner (1976) in their world-wide comparison of body size concluded that Afro-American children growing up under favourable conditions are a little taller and heavier than Europeans and Euro-Americans living in the same cities. This is partly or wholly because they are a little more advanced in maturity. Asiatics, on the other hand, under equally favourable circumstances are smaller despite being still further advanced in maturity. Eveleth (1978a) cited several studies showing that Black children of African ancestry are taller than children of European ancestry when they grow up in a good environment.

Just as there are population differences in body size, population differences in body proportion also exist. Smith and Brown (1970) in their study of preschool children in Hawaii observed that Japanese were as heavy as part-Hawaiians but shorter in stature, although the trunk length was similar. Therefore, the difference in stature is due to the relatively short legs of the Japanese. Grantham-McGregor et al. (1972), on the other hand, found that Jamaican Negro infants had longer legs than Europeans. Malina (1969), in a comparative survey of growth of American Negro and White children, observed that Negro children and adults, had shorter trunks, a more slender pelvis, longer upper extremities, greater arm span, and longer lower extremities (especially a longer lower leg). Eveleth (1978b), in a study of population differences in the body shape of children and adolescents, concluded that Australian aborigines have the longest legs to sitting height followed by children of African ancestry, while Japanese have the shortest legs. These differences are observable at four years of age and probably earlier. Further, offspring of Japanese and Afro-American crosses have relatively longer legs than offspring of Japanese and Euro-American crosses, and fall between Japanese and Afro-American in this proportion. Improvement of environmental conditions could alter body proportion as demonstrated by Greulich's (1957) data of longer legs to trunk during growth of Japanese children living in California. However, Greulich (1976), on remeasuring his original subjects, reported that adult leg length did not differ from that of Japanese adults in Japan. Thus, Eveleth (1978b) concluded, that those differences that were not the result of race mixture did not cause permanent differences in shape. Environment alone is apparently not sufficient to alter body shape. Environmental changes, together with race mixture, however, may produce permanent changes.

3.2.3 Conclusion and Implications

Asians are relatively smaller in size with relatively shorter legs and have less body fat compared with children of European ancestry. These racial differences are due to a combination of genetic and environmental differences.

Since there are genetic differences in size and shape of children, how relevant is it to use growth charts of European standards for children in developing countries? The effect of race on mean preschool weight and height is small compared to the environmental effect as demonstrated by Habicht et al. (1974). Such standards are suitable for assessing the nutritional status of the community if allowances are made for possible differences in genetic potential. However, if one is assessing the health of an individual child, then, for best results one should use standards applicable to the specific populations. For example, the American or British standards are fine for children of European ancestry. However, they may not be suitable if one has to monitor the growth of Asian children as illustrated in Appendix I. They are definitely not suitable for use in the diagnosis of abnormality of body proportions in Oriental or Negro children.

4. Effects of Environment on the Growth of Children

A child's growth depends on his genetic endowment and the environment in which he lives. Growth depends largely on adequate intake of food which must not only be digested and absorbed but also utilized by the body. Several factors influence and interfere in this process of digestion, absorption and utilization, the chief among which are infections and metabolic disorders. Food intake itself is influenced not only by infections and loss of appetite but also by availability of foods, which is partly dependent on socioeconomic factors, catastrophies and the ecological balance that the human being has achieved with the environment. Further, culture will also determine whether available and potentially edible materials are used as foods for children.

In this section, the influence of each of these factors is examined in relation to growth. Although the factors are examined separately, this does not imply that they are not interrelated. For example, poverty is often associated with low education level, lack of knowledge of child care and nutrition and poor utilization of available health services resulting in poor nutrition, frequent infections and ill health. Other social factors such as the structure of the family, the pattern of meals, the birth interval between the child and his siblings, will in all probability influence his nutrition, the illnesses he suffers, his growth pattern and even his chances of survival.

4.1 Difference in body size

4.1.1 Birth Weight

In most countries, higher income families produce offspring with higher mean birth weights. Table 1 shows the means of birth weight of MCDS children by sector. It can be seen that the urban advantaged newborns are the heaviest, the estate children the lightest while the rural and the urban disadvantaged are intermediate. The incidence of low birth weight (< 2,500 gm) is also highest among the estate children (Table 2). These results are not surprising since the estate children belong to the lowest socioeconomic class. The parents of the children in the estate sector tend to have the least education and are in the lower occupational levels.

The birth weight of an infant is strongly conditioned by the health and nutritional status of the mother, in the sense that poor maternal nutrition, ill health, complications of pregnancy and smoking are the most common causes of retarded foetal growth and/or prematurity, as manifested in low birth weight. The result of too little food in pregnancy - often compounded by too much hard physical work - is that the mother-to-be does not gain enough weight during the nine months of gestation. The consequence of insufficient weight increase in pregnancy is likely to be low birth weight. This is probably true of the estate mothers, the majority of whom are rubber tappers and estate labourers.

Low birth weight among the disadvantaged groups not only reflect poor maternal nutrition and care during pregnancy but also the nutrition of the mother during her own growing years as maternal stature is closely linked with the mother's early socioeconomic status. Geefhuysen et al. (1980) found that women of less than 155 cm height were more likely to produce small babies. This is also evidenced by the phenomena of catch-up growth during infancy.

Table 1: Means and Standard Deviations of Birth Weight Of Children by Sector

Birth Weight (gm)	Total	UA	UD	RU	ES	F-ratio	P
mean	3043	3112	3028	3082	2775	31.81	.00
s.d.	512	539	475	483	554		

Table 2: Incidence of Low Birth Weight by Sector

Birth Weight		Total	UA	UD	RU	ES
Low Birth Weight	N	329	66	75	101	87
	%	14	12	12	10	31
Normal	N	2101	480	555	875	191
	%	86	88	88	90	69

Family size also affects the birth weight of the children. The estate and rural families are generally larger with an average family size of 4.1 compared to 2.4 and 3.4 for the urban advantaged and urban disadvantaged families respectively. The nutritional drain on the mother of a rapid succession of pregnancies and periods of nursing produce *maternal depletion syndrome* as there is insufficient time for the mother's body to recover adequately from the last pregnancy, resulting in low birth weight. Hence, spacing of less than two years between births is especially hazardous because it means lower birth weights and poorer nutrition, possibly including a shorter period of breastfeeding or more competition for family resources and care.

Low birth weight is also universally and in all population groups, the single most important determinant of the chances of the newborn to survive and to experience healthy growth and development. There is a higher incidence of physical and mental handicap in infants of low birth weight. Mortality in the newborn period is also higher than in infants of adequate weight, and this increased likelihood of death is present up to the age of one year.

Therefore, proper nutrition and care of mothers during their childhood and pregnancy, together with child spacing, are essential in the prevention of low birth weight babies.

4.1.2 *Growth During Childhood*

a) Effect of Socioeconomic Level on Growth

Children from families belonging to the higher or middle socioeconomic groups of any country are, on an average, larger in body size than their peers in the lower socioeconomic groups. Means of weight and height of upper socioeconomic groups, in different cities, are higher than those of the lower socioeconomic groups.

In Kuala Lumpur, elite Malay infants and preschool children were found to be heavier, taller and had bigger head and arm circumferences than the less privileged Malay children. Further, the weight curve as well as the length curve of the less privileged children deviate progressively with age from those of the elite children, such that the difference at six months of age was 0.3 kg for weight and 1.1 cm for length while the difference at two years of age was 1.1 kg weight and 3.5 cm for length (Chen, 1983, 1990a, 1990b).

The elite children lived in homes with good environmental sanitation, received adequate nutrition and care (including medical care) and suffered from only minor illnesses of an average of 3.6 episodes per person-year consisting mainly of upper respiratory tract infections. On the other hand, children of the lower income Malays would have received a satisfactory diet only during the first few months of life since most Malays breast-feed their babies. However, the weaning diet of lower income families as a whole is often unsatisfactory, consisting mainly of starch and very little protein, vegetable and fruit. The transition from milk to adult diet is sometimes abrupt and the young child is offered bulky adult meals that are overspiced, difficult to masticate, indigestable and spaced out over long intervals. As a result, the young child is only able to obtain a largely carbohydrate (rice) meal together with a little sauce or gravy from the main dishes - a diet that is often deficient in protein, vitamins and minerals.

To compound this difficulty, a variety of food taboos often operate that deny these children essential protein and other food during the period when they most need them. For example, a Malay toddler may be denied fish, one of the few sources of protein available to him, in the mistaken belief that it is the cause of ascaris. It is likely that the slowing down of growth of the less privileged children is largely due to a poor weaning diet and lack of proper transitional diet.

Studies among school children in Kuala Lumpur and Petaling Jaya showed that for boys and girls, the Malaysian Chinese were heavier, taller and had larger head circumference than the Malays and the Indians. However, when household income was taken into consideration, the study showed that irrespective of ethnic group, higher income children were heavier, taller and had larger head and mid-upper arm circumferences than those of the lower income group (Chen, 1976, 1977a, 1985). Further, irrespective of ethnic group, children with a larger number of siblings had a significantly higher rate of underweight and stunting compared to those with less than four siblings (Chen, 1977b). Similar effects were found among British children.

b) Effect of Locality on Growth: Rural-Urban Comparison.

Children in urban areas are usually larger than children in the surrounding rural areas. Eveleth and Tanner in their worldwide comparison of human growth concluded that urban children and adults are generally taller than their rural counterparts except in some developed countries like USA and Australia and some urban slums in developing countries. The urban-rural differences reflect primarily an economic differential between town and rural areas. In general, urban families are better off than rural families when it comes to food supply, medical services and sanitation facilities. Our MCDS study confirms this. On the whole, urban advantaged children, irrespective of race, are significantly heavier, taller and have bigger head and arm circumferences and more body fat than rural children whose growth parameters are better than the urban disadvantaged while the estate children's growth is the least satisfactory (Figures 19 to 21).

Table 3 shows the correlations between home factors (the number of living siblings and parents' occupations and education which reflect the socioeconomic status of the family) and the various anthropometric meas-

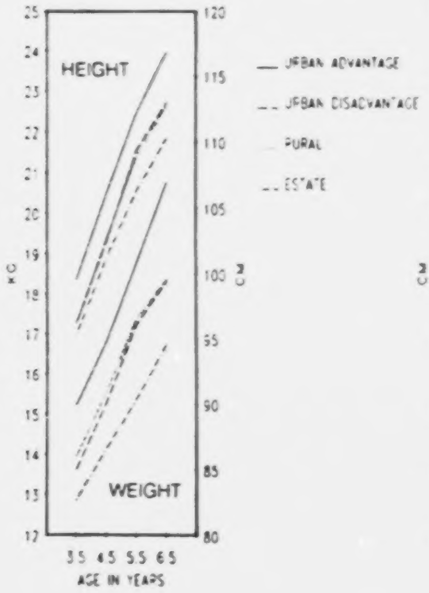

Fig 19: Mean Height and Weight Curves of Children by Sector

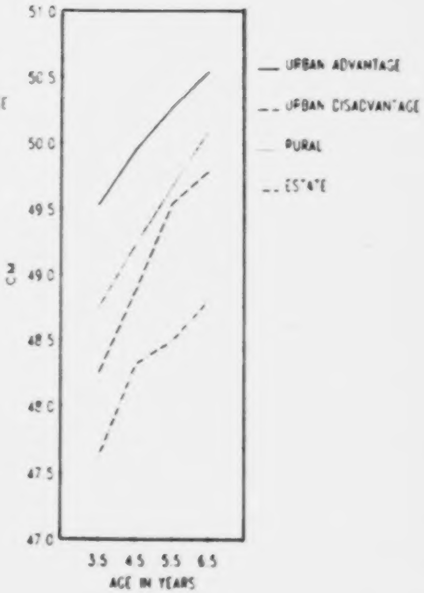

Fig 20: Mean Head Circumference Curves of Children by Sector

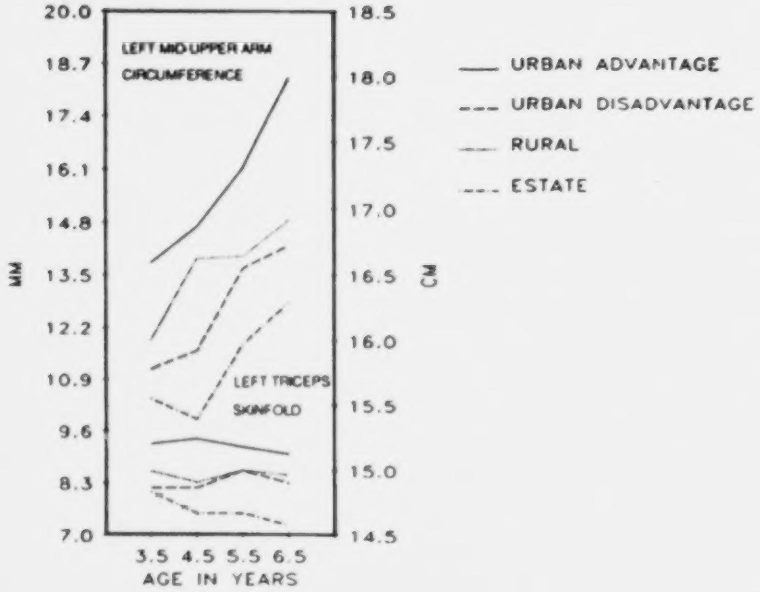

Fig 21: Mean Left Mid-Upper Arm Circumference and Left Triceps Skinfold Curves of Children by Sector

urements. It can be seen that the occupations of the fathers are significantly correlated with the growth of children, that is, children from higher socioeconomic classes are heavier, taller, have bigger head and arm circumferences and more body fat than those from the lower classes.

The growth achievement of urban advantaged children is better than that of the children in the other sectors. This is expected because urban advantaged children lived in homes with good environmental sanitation, received adequate nutrition and care and suffered from only minor illnesses. Urban advantaged children fared best in all nutrient intakes and the estate sector fared the worst while urban disadvantaged and rural children were intermediate. Children in the urban advantaged sector also tend to have the most varied diets. The lack of nutritious food in the poorer sectors is due not only to poverty as animal products cost more, especially meat and dairy products, but also to the lack of information on choice of cheap and nutritious food, cultural practices and priorities in spending. This can be seen in the urban disadvantaged and rural sectors where the Chinese children fared better because, for the Chinese, food comes first in the priorities for spending.

Table 3: Correlations Between Home Factors and Anthropometric Measurement

	Father		Mother		No. of Children	No. of Relatives
	Educ.	Occup.	Educ.	Occup.		
Weight	.17**	-.16**	.16**	-.09*	-.12**	-.02
Height	.12**	-.11**	.09**	-.05*	-.09**	-.01
Head circum	.02	-.08**	.00	-.03	-.02	-.01
Arm circum	.03	-.09**	.01	-.05	-.03	-.01
Skin fold thickness	.02	-.10**	.00	-.03	-.03	-.02

$^{*}p < .01$
$^{**}p < .001$

Besides nutrition, infections could have contributed to the slow growth rate of the less privileged children. Physical examination of the children revealed that the estate children were more dirty, had more skin infections such as boils, scabies, fungal infections, cut and wounds, and ear infections than children of the other sectors. Worm infection was significantly more common among children from the estate sector, followed by those from urban disadvantaged and rural sectors. There was a significant increase with age, indicating continuous exposure to infection. None of the children from the urban advantaged sector were infected with worms. The disadvantaged children too probably had a higher rate of measles infection as the coverage of measles immunization among the less privileged children was very low, being only 34% among urban disadvantaged children and 56% among estate children. The interactions between infection and undernutrition is well-known. Morley (1973) showed that measles infection had a detrimental effect on the growth of malnourished African children. In Malaysia, Chen (1979) had demonstrated that even among the well-nourished children, measles had an adverse effect on their nutritional status and it took several months before their weight returned to their previous centiles.

Infections, especially if severe, cause a decreased food intake due to reduced appetite and often withdrawal from solid foods. There is also a decreased absorption of foods, especially if diarrhoea occurs. Many nutrients and minerals are lost during the period of infection; vitamins and nitrogen are excreted in the urine and their losses are compounded by decreased food intake during this period of stress. The nutritional damage to the host is dependent on the intensity of these infections. For example, heavy hookworm infections can lead to blood loss resulting in low haemoglobin and albumin levels; heavy trichuris infections can cause rectal bleeding and anaemia while ascariasis can cause malabsorption of nutrients such as protein. It has also been shown that during infection there is increased catabolism or breakdown of muscle protein, resulting in the release of alanine which is utilized as a glucose precursor (Richards, 1980). Thus, every episode of infection causes an erosion of the lean body mass and infection is to be regarded as important as dietary intake in determining the nutritional status of an individual. Eveleth and Tanner (1976) in their book, *Worldwide Variation in Human Growth*, concluded that many people in developing countries have mean birth weights at the same level as those in industrialised communities and that in such communities, it is only after the first six months that the weight gains diminish as a result of the interaction of undernutrition and infection.

In young children, there seems to be an association between weight for height and the potential for the subsequent growth. During the period of maximum height increment in seasonal environments, children who have been thin for long periods in the preceding months grow less in height than children who have been fatter. Children are likely to have low weight for height, that is, wasting, as a result of infection and diminished food intake. The length of time for which a child remains below the expected weight for his height is likely to determine his linear growth during the succeeding months. The duration of low weight for height may be a more important determinant than the incidence of low weight for height. If this hypothesis is true, children who gain weight rapidly after an episode of infection will subsequently gain in height at the expected rate. Children whose catch-up growth is less satisfactory as in the case where the diet is inadequate or when the child has frequent infections and there is insufficient time for catch-up growth will, in turn, gain less in height. Such a hypothesis explains the association between poverty and height gain rates, as poor families are less able to ensure rapid catch-up after their children's infections. Also, children from poor families have more frequent infections. It also explains why conditions that worsen the position of the poorest in a community may result in increased stunting prevalence rates with only a transient effect on wasting prevalence rates.

Family size also affects the growth of children. Table 3 shows that there is a significant inverse correlation between the number of siblings and the growth of children, that is, the larger the number of siblings the poorer the growth of children. As stated earlier, the estate families are generally large and this could contribute to the poorer growth of the estate children. From infancy to adolescence, children born into large or closely spaced families experience more sickness, slower growth and lower levels of academic achievement. Children in large families and children born close together grow less well, both physically and intellectually, than other children. The decline in intelligence test scores as family size increases has been vividly demonstrated in studies of large numbers of children in Scotland, England, France and the United States (Maine, 1981).

The employment status of the mother has been shown to effect the physical growth of children. More than 25% of the urban advantaged mothers held either Class I or II jobs whereas none of the mothers from the other sectors were in this occupational level. The majority of the estate mothers, 66.1%, were either rubber tappers or estate labourers. Nearly 50% of the urban advantaged mothers were housewives compared to 76.5%, 72.1%, and 30.8% in the rural, urban disadvantaged and estate sectors respectively. Maternal employment contributes to family income. On the other hand, it reduces the time the mother is able to devote to her child and to food preparation. When these two sides of the question are put in balance, what is the outcome for the children's nutritional status? Three recent Indian studies (Gopalan, 1988) have found a striking relationship between income and occupational status on the one hand and physical stature on the other. It appears that the more *lowly* (using the expression for the sake of convenience) the job that a community is engaged in, the greater is the degree of stunting in its children and adults. The cart pullers, scavengers, manual labourers are apparently the ones who are most stunted and have the lowest body weights; unfortunately, these are precisely the occupation groups who stand in greatest need of a sturdy body build for optimal productivity and output and for earning a reasonable wage from their occupation. In developing countries, where communities are caught up in the poverty trap, neither the genetic potential for physical growth nor that for intellectual activity is able to find adequate expression, and a considerable part of the human resources of the state are forced to drift to jobs calling mostly for unskilled or semiskilled labour. Stunting is the outstanding feature of this poverty trap. In fact, it appears to be the feature that ensures that not only this generation but the next as well does not escape from the poverty trap. Stunted children with impaired learning abilities and schooling end up as stunted adults with low levels of productivity, educational attainment and resourcefulness, earning low incomes and thus continuing to be enmeshed in the poverty trap and so unable to feed their children adequately. Stunted women beget offspring with low birth weight who thus start their lives with an initial handicap, which compounds the effects of superimposed undernutrition in their infancy and childhood. Thus, stunting and the poverty with which it is invariably associated continue from one generation to another.

The employment status of the mother also affects the quality of child care among children as non-working mothers are in a better position to provide quality child care. Most of the estate children are left at estate-based child care centres while both parents are at work. An overview of child care services in Malaysia (Yusof et al., 1987) revealed several significant findings. Estate-based centres were ranked the worst, having the most inadequate physical facilities, the poorest environmental health and staff attitudes, imbalanced staff:child ratio and poorly planned programmes. They were less likely to teach children personal hygiene habits. In addition, one-third had no provision for food storage and 90% were fly-infested. They also looked after more children in the younger age group and had the highest proportion of children below one year old. The overcrowding of children together with poor environmental health supervision could increase their susceptibility to contagious diseases. On the other hand, the good urban child care centres had sound physical facilities, good environmental health and well-planned programmes while supplying the most comprehensive range of amenities. The educational standard of the staff was also higher and overall, they were more knowledgeable and had more experience than the staff in the other types of centres.

A recent review by Tucker & Sanjur (1988) on maternal employment and child nutrition found that when suitable mother substitutes are available, children grow well. This is reflected in our study where although 50% of the urban advantaged mothers are working, they are able to provide quality mother substitutes.

Another contributing factor to the physical growth of children is maternal literacy. Our study shows that there is a significant correlation between the educational level of the mother and the growth achievement of the children. In this aspect, the estate children were again disadvantaged as the majority of their mothers (90.4%) had either no formal education or only had primary level education. The urban advantaged mothers, on the other hand, had all received at least primary level education with 27.4% attaining university level while more than 90% of the rural and urban disadvantaged mothers had received at least primary school education and 0.4% attaining college level. While maternal literacy may also contribute to better family income due to better employment potential, literacy even among non-working mothers would affect knowledge, attitudes and practices pertaining to nutrition, child health and domestic hygiene. A mother's concept of cleanliness, health and hygiene will have a strong impact on the health and well-being of the family. Many studies during the past three decades have established that low levels of infant and child mortality are almost invariably associated with high levels of female education. In some countries, for example Kerala, very low infant and child mortality levels have been achieved where levels of female education are high, health inputs moderate and incomes per head low to moderate (Caldwell, 1979). A study in Bangladesh by the International Centre for Diarrhoeal Disease Research concluded that ". . . the single most important correlate of child survival is not, as might be expected, the family's wealth or the availability of medical facilities but the mother's educational level" (Grant, 1985) and in a comparative study of 25 countries, giving all mothers seven or more years of education was estimated to lower infant and child mortality by an average of 41%. In two further studies, in which the effects of many more socioeconomic variables were controlled, the implied reduction averaged 25% for Indonesia, Pakistan, the Philippines and Sri Lanka (Trussel & Pebley, 1984).

Numerous reasons have been suggested for the dominant effect of maternal education in accounting for child mortality differentials. Initially, it was thought that the level of education was just a reflection of the household's standard of living. The more educated the women, the more likely she is to have an educated husband and a higher income. Improved purchasing power results in better housing, sanitation, nutrition and health care. Increasingly, these arguments have been superceded by others demonstrating an important independent role for education. It is now believed that schooling enhances a woman's ability to provide adequate child care not simply because she is wealthier, but because she is less fatalistic, more knowledgeable about health, hygiene and nutrition, and better equipped to deal with modern ideas and institutions. Education is said to increase the mother's status and power within the family, encouraging her to abandon such customs as providing food for male adults at the expense of children.

Thus, it can be seen that good home environment with proper nutritions, as well as the health literacy of mothers, are important determinants for normal growth and health of children.

c) Secular Trend

Over the past 100 years in industrialised countries and recently in some developing countries, children have become larger and growing to maturity more rapidly. For example in Malaysia, rural Malay boys in the 1970's were found to be taller than those in the 1950's (Chong, 1980). In some upper and middle class families in the United States, this secular increase has stopped. This paper compares the growth of Malaysian children with similar socioeconomic backgrounds but born about twelve years apart.

Data were obtained from records of 227 children born between 1968 and 1973 and 238 children born between 1980 and 1985. The children were followed-up regularly at the University Hospital Child Health Clinic in Kuala Lumpur from birth to five years of age. Measurements for their weight, length and head circumference were taken on each visit.

4.1.3. Observation

Figures 22 to 24 compare the median lengths, weights and head circumferences of boys and girls of the 1968-1973 cohort with those of the 1980-1985 cohort. It can be seen that there is a directorial indication that boys and girls of the 1980-1985 cohort are taller, heavier and have bigger head circumferences from birth to five years of age and the difference widens as the child grows older.

4.1.4 Discussions

This study clearly shows that a positive secular trend in height, weight and head circumference has taken place in the last decade. The secular trend to children getting larger reflects that there is an improvement of living conditions with time.

During the past quarter of a century, Malaysia has made considerable improvement in its socioeconomic and health fields. For example, the country's Gross National Product (GNP) has been increasing at an average annual rate of 4.4% till 1980 and its per capita annual GNP has reached US$2,000 in 1985. This compares favourably with that of many other developing countries. The life expectancy for male has increased

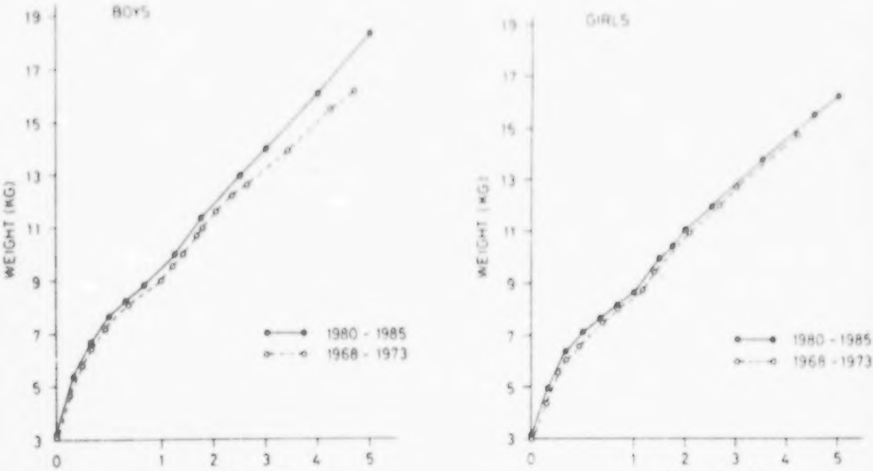

Fig 22: Weight Medians of Boys and Girls in 1968-1973 and 1980-1985 cohorts, Aged from Birth to Five Years

from 54 years in 1960 to 68 years in 1986. The mortality rates of infant and child (aged 1-4 years) too have declined rapidly and by 1987, the infant mortality rate in Peninsular Malaysia was 14.6 per 1000 live births.

The factors involved in the positive secular trend are manifold. The most important of these is probably nutrition. Although details of the children's diet are not available, it is my impression that the 1980-1985 cohort has higher intake of protein. Chong (1982) found that there has been an increase in the availability of food such as rice, wheat flour,

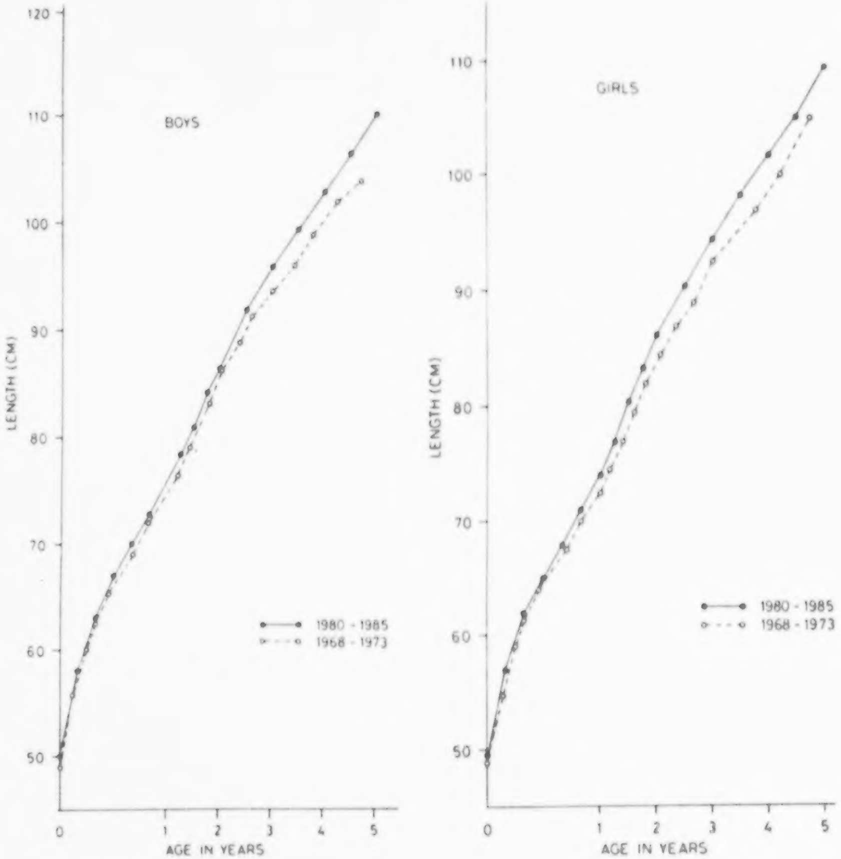

Fig 23: Length Medians of Boys and Girls in 1968-1973 and 1980-1985 Cohorts, Aged from Birth to Five Years

sugar, poultry, eggs, milk and fats in recent years in Malaysia. The MCDS found that the protein intake of preschool children, both among the advantaged as well as the disadvantaged, was adequate. Takahashi (1984) attributed the positive secular trend of Japanese children in recent years to increased consumption of protein and dairy products, particularly milk through the nation-wide introduction of school lunch programme in which Western type of food is offered.

Other environmental improvements, such as better housing, better medical and health care, control of communicable diseases through immunization, sanitation facilities and use of health facilities, could have contributed to the accelerated growth.

d) Effect of Psychosocial Stress on Growth

There is now clear evidence that in some children, psychological stress causes relative failure to grow. It does this by affecting the secretion of growth hormone. When the stress is removed, secretion of growth hormone occurs again, and in clinical cases, a catch-up occurs.

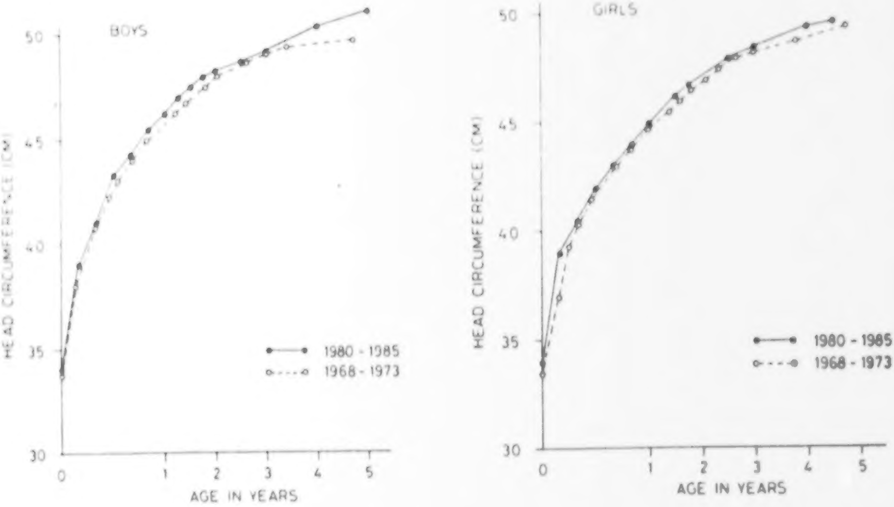

Fig 24: Head Circumference Medians of Boys and Girls in 1968-1973 and 1980-1985 Cohorts, Aged from Birth to Five Years

4.2 Differences in body shape

There are population differences in body shape. Unlike body size, body shape is less influenced by environment which was discussed earlier.

4.3 Conclusion

As growth is influenced by many environmental factors, the promotion of optimal growth requires a holistic approach of raising the socioeconomic status and educational level of the community; improving medical and health care to the community, including maternal and child health, and control of communicable diseases and educating parents on child care such as family planning, sanitation, child nutrition, immunization and the use of health care facilities.

5. Summary and Conclusion

A child's growth achievement depends on his genetic endowment and the environment in which he lives. Comparative studies of children of different races, growing under similar environmental condition, have shown that population differences in body size and shape exist.

Comparison of a group of higher income Malay children with Caucasian children shows that generally, the growth of Malaysian and Caucasian children are different during the first six years of life. At birth, the average Malaysian boy and girl from the present study were less heavy, shorter in stature and had a smaller head circumference than Caucasians. However, Malaysians grew rapidly and were as heavy and tall with similar head and arm circumferences and body fat as Caucasians till about five to six months of age when they again became increasingly lighter and shorter with smaller head and arm circumferences and less body fat. However, the average Malaysian boy and girl had slightly longer crown-rump lengths than their British counterparts, who had relatively longer legs. The differences in growth achievement between the two groups of children are discussed and it is concluded that Malaysians, like other Asians, when compared with children of European ancestry, are smaller in size with relatively shorter legs and less body fat due to a combination of genetic and environmental differences.

Our studies also confirm the results of various studies in the world that boys, during the first 10 years of life, are in general, heavier, taller and have bigger head circumferences than girls who in turn have more body fat than boys. Thus, the basic difference between boys and girls seems to be that of a bigger body size in boys due to a predominence of musculo-skeletal tissue since body weight is the sum total of fat, muscles and bones.

Comparative studies of children of similar racial origin but growing under different environmental conditions have shown differences in their body size and shape.

This paper looks at the influence of environmental factors on the growth of children by comparing the growth achievement of Malaysian children living under different environmental conditions and at different time periods. In general, higher income families produce offsprings with higher mean birth weight. This is largely due to better nutrition and care of mothers during pregnancy and childhood. Children from higher socioeconomic groups are, on an average, larger in size in terms of weight, height, head circumference, arm circumference, crown-rump length and leg length. They also have more body fat. This is largely due to a better home environment including sanitation, nutrition, health and care enjoyed by the better-off children. Generally, urban children are larger than rural children, mainly due to economic differences between the two areas. In most countries, the secular trend to children getting larger still continues, reflecting an improvement of living conditions with time. Unlike body size, body shape is less influenced by the environment and the change in body proportion brought about by environment is not permanent.

Since there are genetic differences in the size and shape of children between Asian and Caucasian children, Asian growth charts should be used for monitoring the growth of Asian children. As growth is influenced by many environmental factors, the promotion of optimal growth requires a holistic approach of raising the socioeconomic status and educational level of the community; improving medical and health care to the community and educating parents on child care.

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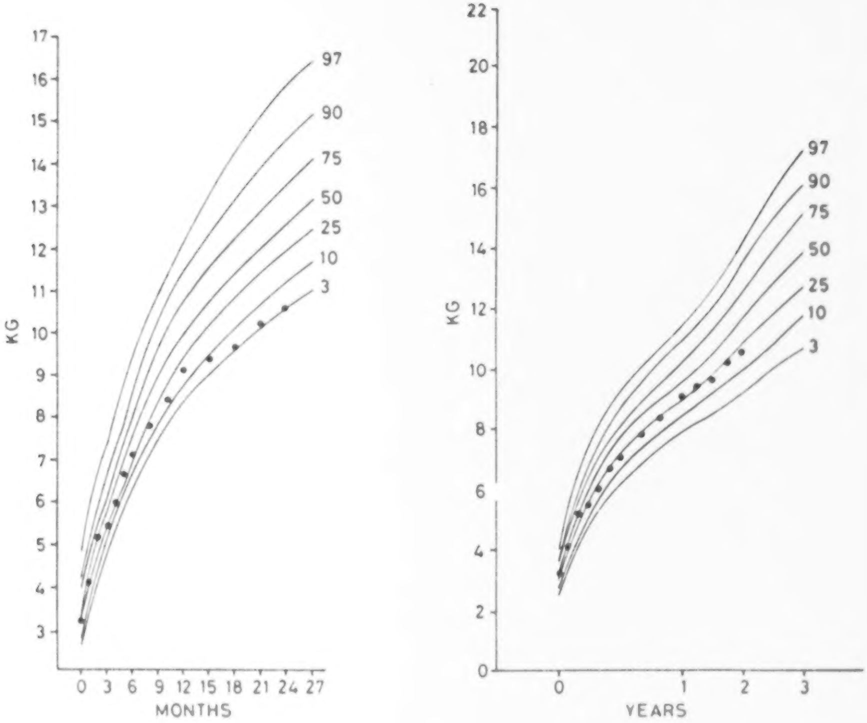
Appendix I



The weight of a Malaysian boy plotted on the Harvard weight chart (left) and on the Malaysian weight chart (right). On the Harvard chart the weight curve begins to deviate from the 25th percentile from the age of 6 months to reach the 3rd percentile at aged 18 months. On the Malaysian chart, however, the weight curve follows the 25th percentile from birth to age two years.

Sanitation and Child Development

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Introduction

The field of medicine, particularly preventive medicine, is now directing most of its efforts to studying the relationship between man and his environment solely for the purpose of eliminating infections and ultimately disease. This will very much depend on the adjustment between man and environment and can be achieved in two ways: either man must alter his ways of living to suit his environment or he must modify his environment to suit his ways of living.

For all intents and purposes, it has to be a measure of both. The basic objective then is to create conditions of living in which diseases/infections cannot survive in that environment and this can be achieved more by coordinated progress in economic, cultural and social spheres leading to a pattern of living.

Epidemiological studies carried out all over the world and in Malaysia show that diseases or most infections are usually confined to specific endemic areas, particularly slums, squatters, poor periurban and rural areas. The question then asked is why should diseases and infections be prevalent or present in one area and absent in another? It is known that changes in the physical and social environment are key factors accounting for this. The physical environment (particularly environmental sanitation), in which man resides and works, plays a major part in his survival in relative comfort, influences his physical and mental health, his productivity and his sociability.

Research also indicates that infections/diseases in life do not appear at random. They come in clusters, usually of several years' duration, and they include illnesses of different causes or aetiologies. These clusters occur most often when a person has difficulty in adapting to his own environment. Infants and children exhibit a high susceptibility to illness as they have difficulty in adapting to life situations. The ill effects on body functions are not solely due to physical and biological agents such as microorganisms. Changes in social and psychological environment can also result in illness. There is good reason to believe that all disease processes may be modified by the host's adaptation to his social environment. Man's reaction to disease must essentially be seen in an ecological setting, in terms of his total environment, his own physical structure which is determined by genetic and past environmental influences, and his interactions with his present physical, social and cultural environment.

Faulty habits of living are important factors in maintaining disease in a particular community. Low economic and social levels are associated with apathy, ignorance and low standards of personal hygiene. Certain ingrained habits are those that have been acquired in childhood. Ignorant mothers with bad and dirty habits have passed it on to their children. This will go on until people adapt better ways of living and are brought to realise that insanitary behaviour results in ill health. Low standards of hygiene, both personal and public, are responsible for an array of diseases everywhere in the world, particularly where primitive living conditions prevail. Unplanned urbanization has resulted in low standards of living in undeveloped and developing countries and this has resulted in raised prevalence of communicable infections and diseases. Uncontrolled migration of the rural poor to already overcrowded urban areas in developing countries has resulted in the spread of shanty towns where poor sanitation facilities have caused heavy contamination of the environment and high prevalence of infectious diseases. Seventy percent of this segment of the human community of the total world population live in these areas. So, one can imagine the magnitude of the problems facing this community, particularly children and infants.

Definition

Having highlighted the basic features in the introduction, we now need to define the term *sanitation*. Sanitation (*sanitas*, health) is defined as 'the use of measures designed to promote health and prevent disease; the development and establishment of conditions in the environment favourable to health'. Sanitation can then be divided into three aspects:

A Environmental sanitation
B Food sanitation
C Personal sanitation or hygiene

A. **Environmental sanitation** - is a procedure involving measures to keep the environment clean and free from waste and decaying matters, animal and human excreta, putrefactive agents, gases, poisons, smoke, infective and obnoxious materials dangerous to life, insects and other agents associated with human diseases and to provide safe and sufficient water.

Under this, the following can be categorised and any deviation from the norm would constitute unsatisfactory sanitation:

1. Water supply: sanitation of household's water supply is satisfactory if there is a tubewell or other source of water supply within 400 meters of the household and the area within 15 meters of the well is free from any source of pollution. The members of the household should use the water for drinking and this or other well water for all domestic purposes (cooking, washing utensils and bathing). Bathing in ponds and rivers cannot be safe since the household members may wash their animals or defecate in these places which are usually polluted.

2. Sanitary pond (well): a pond is regarded unsatisfactory if there is no fence around it. No one should be allowed to go into it nor animals be washed in it. Aquatic vegetation should be removed periodically. A toilet should not be constructed near the pond. Any deviation from this will be regarded as not satisfactory.

3. Separate kitchen (kitchen sanitation): sanitation in this respect is regarded as satisfactory if a dwelling house is provided with a separate kitchen, from which no smoke passes into the living quarters.

4. Shelters for domestic pets and animals: it is unsanitary to keep domestic pets and animals in the living quarters or within 7.5m (25 feet) of the living quarters. Pollution can come from droppings or excreta, e.g. diseases of birds such as psittacosis and cryptococcosis.

5. Refuse and garbage disposal: refuse is the unwanted or discarded solid waste material from houses, or from business and agricultural premises arising from man's activities. Garbage is also waste, arising from the preparation, cooking and consumption of food containing organic matter which ferments on storage. If garbage and refuse are not removed from the dwelling at least once daily then it is considered unsanitary.

6. Setting of houses: there should be an open space all around the house. Buildings should not exceed one third of the total area for housing. If the limit is exceeded then it will be regarded as unsatisfactory.

7. Proper light and ventilation: there should be adequate light so that one can read or write. Proper ventilation means adequate passage of fresh air from the surroundings to the house.

8. Floor space: the accepted standards for floor space are as follows: 10.2 sq meters for 2 units, 8.4-10.1 sq meters for 1.5 units, 6.5-8.4 sq meters for 1 unit, 4.6-6.5 sq meters for 0.5 units, 4.6 sq meters for 0 unit. A baby less than 12 months of age is not to be counted; children between 1 and 10 years old are counted as half a unit, and above 10 years as a full unit. Each unit represents one person. Overcrowding, bad housing and disease has a tremendous effect on child mortality.

9. Sanitary latrine: an open latrine and no fixed place for defaecation are regarded as insanitary. Water seal and pit latrines are sanitary if they are used by all members; non-usage of such latrines indicates the use of an open or unfixed space for defaecation in or around the household which might affect others in the family.

10. Cleanliness of living quarters: it is unsanitary if refuse is found in the vicinity and are breeding grounds for insects and other vermins such as rodents.

11. Household sanitation: is considered satisfactory if all eight criteria such as cleanliness of the living quarters and courtyard, sanitary latrine, safe water supply, floor space/person, separate kitchen, proper setting of the house, refuse and garbage disposal, and shelters for domestic pets and animals are concurrently present in the house up to the satisfactory level.

B. **Food sanitation** (food hygiene) - the supply of safe clean food that is essentially a matter of hygienic production, handling, distribution and serving of all types of food stuffs. The measures include

   1. food plant sanitation;

   2. controlling hygienic quality of perishable foods; and

   3. sanitation in a household (preparation of food) and in category establishment.

C. **Personal hygiene** - the health measures applied to persons. This has been recently elaborated to include care of the mother and infant, the preschool child and school-child, the adolescent, the male and female workers, the aged and invalid. So hygiene is the proper care of the body to permit the normal functioning of the various organs and tissues while sanitation is the proper cleanliness of the environment, that is, health of the individual and health of the community.

What is the relevance of sanitation to child development? Is sanitation important in determining the health status of children? What are the negating effects that sanitation has on the development of the child, be it psychological, physiological, anatomical, emotional or mental?

The answer is very varied and, in the time allocated to me, I shall discuss the negating impact of environmental sanitation (that includes food sanitation and personel hygiene) and importantly, the cofactors that directly or indirectly play a crucial role in child development. I shall discuss this by dividing them into three categories:

(a) The Ecology of Disease and Poverty to Sanitation

Man-made changes in the environment play a crucial role in infection and disease transmission. Many human pathogens evolved early in the history of mankind when communities were small, isolated or crowded, and where standards of hygiene were low. Man, the organisms, and the vectors that transmit diseases are all part of the ecological system. The interaction of man and his environment is an important determinant of the incidence of disease. The disease pattern of a society actually reflects the standard of living and the whole way of life. Defects in sanitation, water supply and food hygiene are most likely to give rise to infection.

The single most important factor that is associated with sanitation and child development is infection or disease. All infections have profound effects on the food intake, metabolism and excretion of most nutrients and, hence on nutritional status (Scrimshaw et al., 1968). Infections intefere with feeding, particularly with respect to diarrhoeal diseases. Respiratory infections, on the other hand, usually predispose a person to further infection in specific ways while respiratory virus infections predispose a person to respiratory bacterial infections.

Sanitation ——> Infections ——> Child Development

Sanitation ——> Disease ——> Child Development

The pattern of diseases is usually affected by high rate of fertility typical of poverty syndrome. High fertility, resulting in short interval between births, has a direct impact on health, largely because less nutrition and care are available for each successive child. Morbidity and mortality are high and children are particularly disadvantaged. The population pressure on the land leads to overcropping and, hence, poor general nutrition. High population density and large populations are closely related. Rapid urbanization, crowding and the presence of high density populations affect transmission of diseases. In small communities, living under crowded conditions with direct contact occuring between persons, self innoculation occurs with efficiency especially in the transmission of respiratory infections. This occurs spontaneously. In the process of crowding or population growth, it becomes difficult to provide for safe sufficient water supply, garbage disposal and sanitation for the community or other social infrastructure. The population growth also slows the improvement of educational levels and per capita income which has an overall detrimental effect on health.

Under such conditions, namely poverty, overcrowding, high fertility, population growth and rapid urbanization, the environment becomes contaminated with excretions or body discharges, resulting in the transmission of diseases. For some diseases, unhygienic food habits play as great or even a greater part in the transmission than insanitary disposal of human excreta. This will result in ill health, disability, morbidity or even mortality in children. In many developing countries, the very young are most susceptible to disease. Half of all deaths reported throughout the world have been from children under 5 years of age.

(b) Malnutrition and Disease to Sanitation

Sanitation ——> Disease ——> Malnutrition ——> Child Development

In most parts of the world, malnutrition remains the single most important predisposing factor impairing the growth and development of children. Malnutrition and infection interact synergistically and is endlessly complex. It tends to increase host susceptibility to infection and infection may precipitate or aggravate malnutrition. In other words, infection and disease impair the nutrition process. When food is scarce, malnutrition is aggravated and the undernourished are more susceptible to infection. Thus, a vicious circle is formed.

Malnutrition is rampant in large families and is a major cause of death in young children, particularly infants. During the protracted weaning process, there is a continous exposure to infection and progressive nutritional deterioration. Dietary disadvantages are aggravated by unhygienic conditions which are reflective of the low levels of education, poor environmental sanitation and improper personal hygiene. Malnutrition is significant as it affects the body's resistence and when associated with disease agents, it increases the incidence of clinical disease and aggravates its severity. Disease can also bring on malnutrition by increasing food requirements at a time when effective food absorption is often diminished.

A longitudinal study was carried out in the poor suburbs of San Jose, Costa Rica to illustrate the relationship between severe acute lower respiratory infections and malnutrition. One hundred and thirty seven children between 0-4 years of age were divided into normal weight children and children with malnutrition to the second and third degrees. Home visits to monitor the incidence of disease were paid once a week by a physician during the year. Though the average number of attacks of respiratory tract infections was the same for all ages in malnourished and normal weight children the average duration of the infections was significantly longer in malnourished children. Complications of pneumonia and bronchopneumonia occured nineteen times more frequently in the malnourished than in the normal weight children (Pio et al., 1985).

(c) Human Wastes and Diseases to Sanitation

Environmental —> Diseases —> Nutritional —> Child Development
Sanitation Deficiency

The single group of diseases associated with environmental sanitation which affect children in developing countries most is the group of diseases that are contaminated by human wastes in food, water, drink and soil. Human faeces are potentially dangerous and represent a health hazard for all those who come in contact with them because they may be a source of various bacterial, viral and parasitic infections. For nearly all the diseases, man is either the sole or principal host of the parasites or he is the reservoir of infection. Without contamination of the environment by human wastes, the disease cycle will come to an end. Three quarters of the urban population in the developing world have more or less adequate excreta disposal facilities as compared with only 15% in the rural sector (WHO, 1976). It must be stressed here that the sanitary conditions in the South East Asian region is the worst in the world (WHO, 1976). It is also worth mentioning here that 78% of the total world population in rural areas are without adequate water supply and 85% are without satisfactory sanitation services (WHO, 1976).

Possible Methods in the Transmission of Diseases Related to Sanitation

The list of housing related diseases associated with bad sanitation is long and those affecting infants and children can be categorised into:

a. Infections maintained in human community by insanitary living habits, often resulting from absence of proper systems for collection, storage and disposal of solid and liquid wastes and human excreta, leading to biological pollution of the surface soil and water courses. The infection is through virus, bacteria and protozoa and from ingestion of water or food which has been contaminated directly or indirectly with infected human faeces or urine. Example: polimyelitis (infantile paralysis), amoebiasis and infectious hepatitis.

b. Worm infections in which transmission follows ingestion of either the egg or larval form of the parasite, such as ascariasis, trichuriasis and toxocariasis.

c. Worm infections resulting from penetration of skin by immature stages of the parasite, for example, hookworms.

d. Bacterial diseases due to consumption of food-stuffs infected from human or animal sources and commonly referred to as food poisoning. Examples: salmonellosis, bacillary dysentery, cholera, typhoid, paratyphoid, Staphylococcus food poisoning and *Clostridium welchii* food poisoning.

e. Bacterial, viral and protozoan diseases acquired through aerosol methods by living in crowded, poorly ventilated houses subject to fluctuations of temperature and seasons, and air pollution. Examples: respiratory diseases such as pneumonias, pneumocystosis, tuberculosis, whooping cough and meningococal meningitis.

f. Diseases transmitted by mothers to infants by the process of chewing or biting the food in the mouth and then feeding the bolus to infants. Examples: viral and bacterial diseases such as tuberculosis.

g. Diseases associated with close proximity and contact as a result of overcrowding, poor house sanitation and personal hygiene. Examples: scabies, leprosy, syphilis, trachoma and trichomoniasis.

h. Diseases maintained and transmitted by insects (such as flies and mosquitoes) and rodents solely because of indiscriminate sanitation. Examples: dengue haemorrhagic fever, Japanese B encephalitis, Chagas disease and Bancroftian filariasis.

i. Diseases transmitted by faecal contamination of the human environment by animal vomitus and faeces. Examples: toxoplasmosis, echinococcosis and taeniasis.

Diseases related to environmental sanitation (domestic sanitation) can be broadly categorised into four areas:

(a) overcrowding (inadequate and unhealthy housing), for example, respiratory diseases;

(b) materials used in the building, for example, allergic diseases;

(c) deficiencies in sanitation - faecal contamination inside or outside the household, for example, parasitic diseases, bacterial and viral diseases.

(d) deficiencies or inadequancies (both in quantity and quality) in water supply, for example, faeco-oral diseases, water-borne diseases or diarrhoeal diseases.

Deficiencies in water supply causing diarrhoeal diseases, air borne diseases and diseases caused by the contamination of the environment by human wastes form the core of the diseases reported among children and infants of the developing world, including Malaysia. These diseases are not only responsible for sickness, low life expectancy and death but they also prevent social and economic progress (Yusuf & Zakir, 1990). Domestic sanitation, a very important determinant of health or disease in human population, has been neglected in the developing countries (Yusuf & Zakir, 1990). Malaysia is not excluded in having poor domestic sanitation. Diarrhoeal, parasitic infections/diseases and other communicable diseases are widespread in urban slum areas, squatters, estates, new villages, rural areas and underserved populations in this country.

Child Development and Environment

When child development is discussed, we need to look at it from two environments, namely:

1. Maternal environment - when the child is in utero;
2. Biological environment - when the child is outside the uterus.

1. The Maternal Environment

Under optimal conditions the foetus is well protected from infections (Mata et al., 1977). However, a number of viral, bacterial and protozoal infections have been associated with prenatal infections which are common among low socioeconomic families living in absolute poverty and in highly contaminated environment. The influence of the intrauterine infections begin from the moment of conception. Table 1 shows some of the common viral, bacterial and protozoal infections that have been found to cause intrauterine infection and damage to the foetus.

Most often infections in the mother do not cause clinical manifestations in the foetus though interruption of pregnancy, preterm delivery, foetal growth retardation, embryopathy (a diseased embryo) and overt disease and, sequlae on growth and performance, may occur. These microorganisms have a profound influence on the growth, development and survival of the child. Many antenatal infections are manifested in the mother and without any apparent

Table 1: Viral, Bacterial and Parasitic Agents Infecting the Foetus

Polio, coxsackie A, coxsackie B, echovirus
Lymphocytic chriomeningitis
Influenza, mumps, measles
Rubella
Cytomegalovirus, herpes simplex, varicella-zoster
Hepatitis A, hepatitis B
Toxoplasmosis
Hookworm
Schistosomiasis
Listeriosis
Syphilis

consequence on the foetus but many children are born handicapped or will become so over a period of time. In fact, a very high incidence of foetal growth retardation has been recorded (Mata et al., 1977).

It was only in the 1940's that an epidemic of children with cataracts, deafness and heart defects in Australia due to rubella that led medical scientists to believe in congenital infections. These children were later found to develop growth deficiency and hypothyroidism which became apparent at childhood. Foetal damage, as a result of rubella, is thought to result from infection of the placenta. Intrauterine growth is impaired and foetal metabolism is destroyed.

Severe intrauterine infection can have the following consequences:

- interruption of pregnancy
- preterm delivery
- premature births
- foetal growth retardation
- embryopathy (diseased embryo)
- spontaneous abortion
- still births or perinatal deaths
- heart lesions
- anemia
- small size
- neurological alterations
- congenital defects
- intracranial calcification
- deafness

- mental retardation - mental and psychomotor
- ocular lesions - retinochoroiditis
- squint
- microphthalmia
- cataract
- scotoma
- altered light reflex
- amblyopia
- blindness

2. *Biological Environment*

a) Respiratory and diarrhoeal diseases

In 1966, Jelliffe referred to diarrhoea, pneumonia and protein-calorie malnutrition as the *big three* among the killer diseases of early childhood. It was estimated that in 1982 alone, diarrhoea caused over one billion episodes of illness and 4.5 million deaths in small children. The second most common cause of death is acute respiratory infection which is estimated to cause 3 to 4 million deaths a year in children. The diarrhoeal diseases and acute respiratory infections interact with malnutrition so that most of the deaths occur from a downward spiraling sequence of multiple synergistic combinations (Scrimshaw et al., 1968). It has been estimated that 2 million deaths are due to measles, 1.5 million to pertussis, 1 million to tetanus and another 2.5 million to other causes. The causative agents include multiple bacterial, viral and protozoal organisms. Usually most diarrhoea attacks are acute, some cases become chronic, usually defined as symptoms that last from more than one week.

A number of factors play a contributory role in the transmission of these diseases. These include poor nutritional status, bad household sanitation, overcrowding, lack of potable water supply, poor hygienic habits, inadequate excreta disposal facilities or primitive sanitary conditions, immunosuppression caused by malnutrition and unsatisfactory housing conditions (such as exposure to rain, chilling breeze and smoky conditions). Bottle-fed babies in slums are most vulnerable to diarrhoeal infections. Infectious diarrhoea is an important problem in child day care centres, particularly in centres which have children who are not yet toilet trained (Bartlett et al., 1985) and do not adhere to health regulations.

Several studies carried out have shown an association between environment and mortality from respiratory diseases in childhood. Severe respiratory infections in children are often associated with crowding and where air pollution was concentrated (Daly, 1959), and are most marked in children under the age of one (Collins et al., 1971). The best known risks are low birth weight, malnutrition and indoor air pollution. Other than the immediate morbidity or mortality due to acute respiratory infections, it has also been found that acute lower respiratory infections may have adverse effects on the subsequent health of the children, in terms of chronic pulmonary diseases. In other words, respiratory illness in childhood may mark the beginning of a lifetime of chronic respiratory disease in some individuals (Reid, 1969). Colley et al. (1973) following a birth cohort until 20 years of age, found that those with a history of lower respiratory illness under two years of age had a higher prevalence of respiratory symptoms at age 20 than those without this history. Reid et al. (1966) also found that a degree of permanent lung damage in childhood had greater risk of developing respiratory symptoms and lung cancer.

Infections, no matter how mild and subclinical, have some adverse effect on the nutritional status, with regard to nearly all essential nutrients (Scrimshaw, 1977). These adverse effects occur as a result of withdrawal of food due to vomiting or coughing, dietary changes from a more nutritious diet to starchy food which is low in protein and calcium, and decreased nutrient absorption and utilization. There is good evidence to show that profuse bacterial overgrowth in the gut can produce a range of clinical consequences including steatorrhoea, carbohydrate malabsorption, hypoproteinaemia, vitamin B12 deficiency and associated macrocytic anaemia, and iron deficiency. Many acute infection, induce stress reactions that result in increased loss of nitrogen, both in the urine and intestine (electrolytes), which increases the requirements for protein. For example, kwashiokar is precipitated by episodes of diarrhoeal diseases, measles or other communicable diseases. Kwashiokar becomes more evident after epidemics of diarrhoea or other infectious diseases in young children of 3 or 4 weeks. Spicer in England found that children with meningitis, infantile diarrhoea, chronic tuberculosis, measles, whooping cough and severe chicken pox frequently developed xerophthalmia (systemic deficiency of Vitamin A) and this has been found to occur sporadically after infections among malnourished infants in developing countries.

The frequency of infection and its effect on growth and development have been observed throughout the developing world. One of the deleterious effects of infection among the socioeconomically deprived children and infants is impairment of physical growth and development. Illnesses have been shown to slow down growth. Data on skeletal age have led to the suggestion that short illnesses have a temporary effect on growth while repeated or chronic illness might affect a child's final height (Rona, 1981). It is well documented that an episode of acute diarrhoea results in a drop in weight and a temporary cessation of growth in infants and children (Mata et al., 1972). Mata et al. (1971) observed a significantly poorer growth in children (weight loss and height arrest) who were exposed to enteric viruses, diarrhoeal diseases, measles, whooping cough and acute respiratory diseases during their first year of life.

In longitudinal studies of asthmatic children, it was reported that these children were not only short but they also had delayed skeletal maturation and late puberty (Rona, 1981). The Oxford Child Health survey of 650 children observed that children from birth to 5 years of age who were without illness would be one inch taller than those who had experienced *severe* illness and 0.4 inches taller than those who had suffered an *average* amount of illness (Scrimshaw, 1981).

Infections produce protein deficiency which may later prevent the formation of antibodies. The number of T cells, macrophages and phagocytosis are reduced and the inflammatory responses are slow. The child is not able to fight these disease-bearing agents and succumbs to them, producing severe vomiting, diarrhoea, anorexia and pain in the child. Without any replenishment, the child can become gravely ill. In a developing child, illness is a stressful experience. If the illness requires further specific intervention (such as surgery, hospitalization and isolation), the child can develop phobia and marked depression. Children can have distorted ideas and frightening fantasies about the illness which may lead to psychological disturbances and changes in behaviour and cyclic deterioration of health may result.

b) Haemorrhagic disease

A classical mosquito borne viral disease, affecting infants and children of this nation in a pandemic fashion and attributed solely to bad or indiscriminate sanitation, is dengue haemorrhagic fever. The outcome of this disease without treatment is death. Data show that the age specific incidence rate is highest in two age groups, namely 5-9 years and 10-19 years with a mean incidence rate of 4.9 cases per 100,000. The mean incidence rate in the infants and toddler group is 2.2 cases per 100,000. Infants and toddlers in the 0-4 years age group were the principal target group, recording a case fatality rate of 16.7%. This is followed by children in the 5-9 years age group, with a case fatality of 8.7%.

The general detrimental effects of respiratory, diarrhoeal and haemorrhagic infections associated with bad sanitation can then be summarized:

Environmental Sanitation	—>	Respiratory & Diarrhoeal Haemorrhagic Pathogens	—>	Malnutrition	—>	Child Development

The effects on the child are:

- decreased immunological resistence
- cyclic deterioration of health
- cessation/impairment of linear growth

- retarded growth patterns
- retarded pubertal development
- lower height and weight muscle wasting
- increased case fatality
- foetal growth retardation

c) Parasitic diseases

Parasitic diseases are of major world importance in terms of their prevalence and grievous consequences. More than one billion people still suffer and die from these diseases. It is estimated that parasitic diseases claim more lives than do all the cancers combined. While the public in general and the physicians in particular are highly concerned with cancer victims, an apathetic attitude towards parasitic diseases prevails, both in developed and developing countries (Tsun, 1982).

Poverty and poor sanitation play a crucial role in the transmission of many parasitic diseases without showing any preference for the rich or poor. Table 2 shows some of the most prevalent parasitic diseases in the world which are all associated with poor environmental sanitation. Three quarters of the affected population are children below the age of 15 years.

The list of parasitic diseases that have detrimental effects on child development is voluminous. Only two examples will be cited to illustrate the method of transmission and the effects they have on child development.

Table 2: Common Parasitic Diseases in Developing World Associated with Sanitation

Diseases	Worldwide
Ascariasis	1300 million
Schistosomiasis	600 million
Hookworm	900 million
Trichuriasis	500 million
Enterobiasis	208 million
Filariasis	200 million
Chagas' disease	12 million

Enterobiasis is a disease that depends upon population density and indoor environmental conditions such as overcrowding and bad household sanitation. This infection is very common in child day care centres, orphanages, hostels, kindergartens and schools. The prevalence of enterobiasis in children in kindergartens in Shanghai was 66%; in orphanages in Taipei, 74%; among child patients in Singapore, 21%; among children in Kuala Lumpur University Hospital, 25%; among children attending kindergartens in Teheran, 63%; and among children in rural Cairo was 96%. The invasive eggs are transferred to the mouth from hands contaminated by scratching the anal region. This practice is very common among children. Soiled night clothes are another anus-to-mouth transmission hazard. Other sources include viable eggs on soiled bed linen and contaminated table tops, door knobs or any other objects with which the carriers' hands make contact. The most significant symptom observed in children is a crawling sensation and itching in the anal region. Nervousness, insomnia, nightmares, convulsions and a sharp pain at the anus cause rectal discomfort and anxiety to the growing child. In females, it is even more troublesome as these parasites can crawl up to the vagina and uterus into the fallopian tube. This can produce vaginal discharges, chronic salpingitis and urinary tract infections. The overall effects on the child are constant headaches, abdominal pain, anal pruritis, pallor, dysentery and vulvo-vaginitis. Emotional instability and irritability can lead to psychological problems.

Schistosomiasis is another classical water-borne disease associated with bad sanitation. In this disease, promiscous urination and defaecation of man play a crucial role in the dissemination of the parasite into the environment. The infection is particularly seen in areas where rivers and ponds are sources of water supply for washing, bathing, defaecation and other household activities. Infection is usually acquired at a young and tender age of a few months and becomes exacerbated at approximately 10-15 years of age. This parasite which is found in the portal veins and veins of urinary bladder affects the gastrointestinal tract, liver, lungs, brain, kidneys and virtually all organs of the body system. The changes in the organ system are attributed to eggs secreted by the worms. If a patient has chronic schistosomiasis japonica for two years then at least one million eggs will remain in the body. The disease is characterised by weakness, pallor and dyspnea on slight exertion, resulting in poor digestion, extreme emaciation and dilatation of the superficial veins of the abdomen and thorax, and anemia. Ascites or accumulation of fluid in the abdomen becomes a distinctive sign. Forty three percent exhibit chronic cerebral involvement with epileptic seizures. The liver and spleen are enlarged and the lungs show hypertensive changes resulting in heart failure. The kidneys are damaged and an association with bladder cancer has been reported. The infected child dies as a result of severe malnutrition and complications.

Diarrhoea, dysentry, anemia, fever and vomiting, outcomes of schistosomiasis, are its diagnostic features as a result of decreased food intake, decreased nutrient intake, increased nutrient loss, loss of nitrogen through elevated urinary nitrogen excretion, destruction of red blood cells. The child suffers from reduced or even inhibited growth, physical fitness and general health decline as well as decreased adult weight for height.

d) Intestinal helminthiases

The most dramatic of the pathogens that are directly linked with malnutrition and child development are the special parasitic diseases known as intestinal helminths. Helminth infections and malnutrition are among the most important, most common and most persistent health problems in developing countries today. Approximately, among 60 million annual worldwide deaths from all causes, 30 million are children below 5 years (WHO, 1987). Half of these (that is, 15 million) are attributed to the combination of malnutrition and intestinal infection. Intestinal parasitic infections such as Ascariasis, hookworm infections, trichuriasis and strongyloidiasis are the most common infections and are distributed throughout the world with high prevalence rates in many regions, including Malaysia. Estimates of the global prevalence of the intestinal nematode infections transmitted through soil are as follows: 1300 million cases for *Ascaris lumbricoides*; 900 million for hookworms and 500 million for *Trichuris trichurias* (WHO, 1987), with 32% children forming the target group. Not only is the absolute number of persons infected with these helminths staggering but the prevalence of these infections is also high in the Third World compared with other major infectious diseases (Stephenson, 1987). Ascariasis and hookworm infections rank second only to diarrhoeal disease and tuberculosis in prevalence while trichuriasis and schistosomiasis are among the 11 most common infections (Table 3). In terms of morbidity and mortality, schistosomiasis, hookworm and ascariasis rank among the top 17 infections (Stephenson, 1987). These figures are crude estimates because of underreporting, which is attributed to difficulty in measuring morbidity in chronic helminthic infections as opposed to acute infections such as in diarrhoea and malarial attacks.

These intestinal worms are essentially faecal and soil borne as children are infected through food or drink contaminated with infective eggs or by penetration of intact skin. These parasites, which become infective after a stage of development and survival in contaminated soil, are predominantly seen in disadvantaged children (including infants and toddlers) between the ages of 3-15 years from both urban and rural areas. This target group are most active and least careful about personal hygiene and cleanliness. The host factors affecting the pathogenicity of intestinal parasitic infections are those associated with the conditions predisposing to infection and reinfection. Poor living conditions, inadequate housing without proper water supplies or sanitation (insanitary practices), poverty, ignorance as well as local habits in the disposal of faeces, result in heavy pollution of the environment and high infection rates.

A study carried out among 253 five-year-old kindergarten children in slum areas in Kuala Lumpur revealed an overall infection rate of 91% (Chia et al., 1978) while another study revealed an infection rate of between 43-51% among 764 children (between the ages of 4-6 years) living in urban slums and rural estates in Kuala Lumpur (Kan, 1986). Most of these children had either

Table 3: Prevalence of Major Infections in Africa, Asia and Latin America - 1977-1978

Prevalence	Millions/Year
Diarrhoea	3000 - 5000
Tuberculosis	1000
Ascariasis	800 - 1000
Hookworm infection	700 - 900
Malnutrition	500 - 800
Malaria	800
Trichuriasis	500
Amoebiasis	400
Filariasis	250
Giardiasis	200
Schistosomiasis	200

single or multiple infections. The infection rates with intestinal worms is higher among older children, both from urban and rural schools. The rate of infection with several kinds of worms is 89%. Besides frequent mixed infections, these children were found to harbour heavy worm burdens, as much as 50-100 Ascaris worms. Heavy multiple infection is common among disadvantaged communities and tends to be chronic and persisting throughout childhood. The persistence of worm infection in children is attributed to long life span and high fecundity of the parasites. For example, the Ascaris is able to produce about 200,000 eggs per day for about a year while the hookworms and Trichuris produce about 10,000 eggs per day for several years. Thus, the soil in endemic areas can be heavily polluted by indiscriminate defaecation. Shekhar (1990) conducted a soil analysis from an endemic urban slum and squatter area in Kampung Pandan, Kuala Lumpur. From the soil sample collected from 326 households, both inside and outside, 98.3% of these households were positive for all the intestinal parasites and diarrhoeal disease producing agents.

Cultural practices pertaining to eating habits, food preferences and food preparation, defaecation and other activities may predispose to infection with intestinal worms (Kan, 1991) and this disposition is not linked to any racial preference. The common denominator among communities with heavy worm infections is poor environmental sanitation and low socioeconomic status. Worm infection, thus, is not indicative of any racial predisposition or genetic susceptibility to infection but a reflection of the socioeconomic status and environmental sanitation existing in the community. In a survey of preschool children in four communities, it was found that a default in toilet facilities, water supply, educational status of parents, occupation of parents and family size reinforce heavy infection with intestinal worms.

Parasitic helminths living in the gastrointestinal tract have relatively low energy needs compared with their hosts and direct competition for food is not likely to be a significant cause of the detrimental effects of intestinal parasites (Crompton et al., 1981). They are in good physiological positions to intefere with the nutrition of their hosts. The major nutritional consequences of such infections seem to be due to effects parasites may have on host food consumption or to nutrient losses that occur from tissue damage or the abnormal physiology of the parasitised host (Nesheim, 1985). Ascaris, hookworms and Strongyloides spend most of their lives in the small intestine where most of the digestion and absorption of nutrients take place while adult Trichuris attach themselves to the mucosa of the large intestine. Helminths affect nutritional status directly by causing (i) a decrease in host nutrient intake, (ii) an increase in nutrient excretion or loss and/or (iii) a decrease in nutrient utilisation within the body (Stephenson, 1987). Changes in intake, excretion or utilisation will only cause malnutrition if the hosts cannot replace the abnormal losses either through their dietary intake or from preexisting body stores of the nutrients (Stephenson, 1987). Of the four deficiency diseases, having protein energy malnutrition (PEM), iron deficiency anemia, vitamin A deficiency or xerophthlmia and iodine deficiency, three of them are aggravated by helminthic infections. The only exception is iodine deficiency.

In the majority of cases, ascariasis produces no evident clinical manifestations. However, mainly in children, the worm may be responsible for a widely varying clinical picture, ranging from a vague abdominal pain to severe and even fatal complications. Severe manifestations include obstructive, inflammatory or perforated acute abdomen. Ascariasis is the most common cause of abdominal surgical emergencies in many parts of the world, with high mortality rates. The overpopulation of the bowel lumen results, at least, in congestion and often produces a worm bolus. The worm bolus may cause complete or partial obstruction and finally perforation.

Ascariasis is often associated with respiratory disorders, particularly with asthma. The problem arises during the passage of larvae from the intestine to the lungs and inhalation of Ascaris allergens. There is seasonal pneumonitis with eosinophilia characterised by cough, dyspnoea and substernal discomfort. Cough, fever, anorexia and loss of weight are symptomatic of asthma. If infection with *Ascaris lumbricoides* initiates asthma in already predisposed children, anorexia and loss of weight would contribute to impaired nutritional status.

While the role of *Ascaris lumbricoides* in causing clinical manifestations of disease is well recognised, not enough attention has been paid to the effect of the infection on human nutrition. Both ascariasis and malnutrition are common problems in developing countries, characterised by low socioeconomic status and a low level of public health sanitation. The high infection rate in unsanitary conditions is known to lead to malnutrition through multiple nutrition-infection interactions (Scrimshaw et al., 1968). From research, it is evident that *Ascaris lumbricoides* shows demonstrable effects on the gastrointestinal physiology and nutrient utilisation in human infections. The utilisation of nutrients, especially fat and protein, seems to be impaired. The morphological damage associated with the small intestine during infections is well established. Venkatachalam and Patwardhan (1953) examined faecal nitrogen in nine children infected with *Ascaris lumbricoides* and found that the infection was associated with increased nitrogen loss in all the children. Similar results were observed by Tripathy et al. (1971).

The effects of ascariasis on Vitamin A utilization have been a subject of interest to many investigators who work in endemic areas. Ascariasis interferes with vitamin A absorption and may, in this way, be a contributory factor in xerophthalmia, with its associated morbidity, blindness and mortality. Most populations living in endemic areas will consume most of their Vitamin A as carotinoid precursors. Since the enzymes responsible for much of the conversion of carotene to Vitamin A are found in the intestinal mucosa, damage to these cells might affect carotene conversion to a greater extent than the absorption of preformed Vitamin A. Results have showed impaired Vitamin A absorption and increased worm load. Carrera et al. (1984) found children with *Ascaris lumbricoides* to have considerably more problems with milk consumption than uninfected children. They found a relationship between lactose intolerance and impaired lactose digestion and infection.

Ascaris lumbricoides has adverse effects on child growth (Crompton and Stephenson, 1985). Willett et al. (1979) and Stephenson et al. (1980a) indicate that *Ascaris lumbricoides* is a determinant of malnutrition. There is also a relationship between infection and reduced body weight, delayed puberty and low plasma albumin concentrations (Cole et al., 1982). Low plasma albumin concentrations in young children leading to edema are fundamental to development of kwashiorkar (Alleyne et al., 1977). Ascariasis was found to be responsible for decreases in growth rate, nitrogen absorption and retention, fat absorption, D-xylose absorption, lactose intolerance and mucosal lactase activity. It also can cause structural abnormalities of the small intestinal mucosa in undernourished children in developing countries.

The hookworms have a long life span of between six to seven years. They attach themselves to the mucosa of the upper small intestine by their buccal capsules and suck blood. An individual worm might cause as many as six lesions during the day, each lesion involving about nine villi (Holland, 1987). Blood loss occurs primarily through the sucking action of the worms but bleeding occurs from the damaged mucosa when the worm moves to a new site. A single *Necator americanus* causes a loss of approximately 0.03ml of blood per day, and one *Ancylostoma duodenale* causes about five times as much, or about 0.15ml per worm per day. A person who passes 2000 hookworm eggs per gram of faeces, loses an estimated 1.3mg of iron per day in the faeces for *Necator americanus* infections and about 2.7mg of iron per day in an infection with *Ancylostoma duodenale*. Assuming a haemaglobin level of 14g/dl, average faecal iron loss per person per day has been estimated to be on the order of 5 to 9mg. Since only about 10% or less of iron consumed in food is typically absorbed into the body, a person with only a light hookworm infection must consume at least 13mg of extra iron per day in an infection with *Necator americanus* and 27mg of extra iron per day for an *Ancylostoma duodenale* infection in order to compensate for the iron loss that the hookworms have caused (Holland, 1987).

The clinical entity of hookworm infection is anaemia and the severity depends on the worm burden, health, condition and iron reserves of the host. The most important nutritional impact of the infection on the host is anaemia because of the blood and iron loss. In acute infections, nausea, vomiting, diarrhoea and cramping abdominal pain can occur. This results in anorexia and then reduced intake of food and increased excretion of nutrients occur. In chronic infections, clinical symptoms such as lassitude, breathlessness, palpitations, ringing in the ear, headache, mental apathy and depression (all characteristics of iron deficiency anemia) appear. Cardiological symptoms that include dyspnoea, palpitations and cardiac pain develop. Oedema is manifested.

The amount of growth stunting related to hookworm infection is unknown while, established facts point to protein loss, nutrient malabsorption and anorexia. However, reports from Kenya showed significant improvements in growth rates of children following treatment. Iron deficiency anemia easily leads to anorexia and poor growth. In addition, since mental performance has been found to be much lower in anaemic school children (Webb and Oski, 1973), hookworm anaemia may have a substantial effect on children's learning ability and hence, on their functional capabilities as adults in academic areas. The ability to perform work (physical work capacity) is seriously reduced (Viteri & Torun, 1974; Gardner et al., 1977).

The association between iron deficiency and poor cognitive performance (poor behavioural-test performance) has been well documented in many studies (Fairchild et al., 1989; Beaton et al., 1989). Many studies have shown relationship between iron deficiency and brain function in infants and children (Hallberg, 1989). Hence, the overall effect of hookworms are weight loss, poor growth, low mental performance as well as impairment in learning ability, functional capabilities, reduced productivity and brain function.

Recommendations

The health of children has been a major public health concern throughout the twentieth century. The efforts to improve the health of children can be grouped into three areas:

1. the establishment of traditional public health activities concerned with the environment and communicable disease control, including quarantine;
2. the provision of medical care services, including early diagnosis and treatment as well as immunisation against a variety of communicable diseases; and
3. the developing awareness of the social context of childhood and its effects on children's future health status.

This is marked by an awareness (a) that health related behaviours of adults are a major determinant of their morbidity and mortality and (b) that these behaviours are the result of processes beginning in childhood.

The increasing range and complexity of health problems of infants and children arising from the physical and biological environment are worldwide phenomena, particularly in areas associated with extreme poverty. This situation is predominantly in rural areas, periurban and urban slums, squatters, estates and underserved populations where environmental sanitation is the least attended to. Human behaviour, culture, traditions, convictions, socioeconomic status, educational status are all contributory factors to a disease situation in an ecological niche. In order to remedy the situation, a balanced, concerted and integrated action has to be pursued. The following actions are recommended:

- to provide the greatest possible number of people with sufficient quantities of safe water, including collection of an ample quantity from a safe source and storage of potable water protected from contamination;
- to remove the solid and liquid wastes produced by communities to a safe distance from dwellings; to include good personal and domestic hygienic habits which include hygienic excreta disposal (use of latrines, care in disposing of babies' stool) and washing of hands;
- to help communities build healthy and comfortable houses according to specifications which are properly lit and ventilated and with adequate protection from external hazards;
- to establish and ensure the application of appropriate standards for the control of air, water and soil pollution;

- to develop and promote the health of the working population, particularly that of parents, by raising their socioeconomic status;
- to provide for the control of foodstuffs during their preparation, storage and sale. This should be assiduously enforced in schools, working places, etc.;
- to maintain strict health surveillance of child day care centres, kindergartens, institutions for children, schools, residential colleges and hostels;
- to detect and treat children with diseases, protein energy malnutrition and anemia periodically;
- to control diseases through age-targeted chemotherapy; and finally,
- to improve the nutrition of the child.

There are only a few published studies relating the under-fives' mortality to the quantity of sanitation and water supply. Esrey et al. (1985) estimated that improved water supply, excreta disposal and health education might reduce diarrhoea mortality rates by 35-50% and larger reductions might be expected in diarrhoea mortality in some circumstances. Victora et al. (1988) found that those infants whose homes had piped water had a diarrhoea mortality rate that was 80% lower than those from homes with no easy access to piped water. Wagner and Lanoix (1959) reported that in north eastern Brazil, diarrhoea was found to be the underlying cause of 20% of deaths of infants aged under four months in households with piped water inside the house while it was 60% for those without this facility. Zaheer et al. (1962) were able to show a 43% reduction in diarrhoea mortality at all ages following an introduction of treated water supply. Besides that, increasing water quantity in areas of low or moderate water use is more effective for improving health than is water quality (Esrey et al., 1989).

Acute diarrhoea is common in young children, particularly those between 6 months and two years old. Most of them are due to poor personal hygiene of mothers, insanitary environment which causes contamination (poor household environment), and weaning foods and fluids. Most of the studies which have dealt with relationship between environmental sanitation and the risk of diarrhoea did not take into account personal hygiene that may influence childhood diarrhoea (Alam et al., 1989). Studies on hygiene associated with the use of water, especially those related to hand washing with soap, have shown its impact in reducing diarrhoea rates by 14-48% (Alam et al., 1989). They were also able to demonstrate that the use of clean water (hand pump water), absence of child's faeces in the yard and mother's handwashing had a positive effect on the reduction of diarrhoea incidence. Health and hygiene education together with clean water supply had an impact on diarrhoea in Guatemala (Torun, 1983). Maternal domestic hygiene behaviour also had an impact on childhood diarrhoea in slum areas of Dhaka city (Clemens and Stanton, 1987(a) & (b)).

Daniels et al. (1990) found improved sanitation had a positive impact on diarrhoea morbidity in young children in rural Lesotho. Laterine ownership was associated with a 24% reduction in the incidence of reported diarrhoea. Hookworm disease is an infection which is severe enough and widespread to be an important economic factor in the lives of the people. It is found exclusively in rural and periurban children of school age (6-16 years) because their bare feet are almost continually exposed to hookworm throughout the year. Sanitation alone will control hookworm disease. At least 80% of rural homes and all rural schools must have sanitary toilet and these must be used. This necessitates a change in habits and customs of a lifetime and which can scarcely be accomplished within a decade.

The methodology of controlling disease rather than infection seems to be the logical means of controlling most of the infections, including helminthic at the present time. Targeting treatment toward the population with the highest intensity of infection and the greatest risk of disease, usually children, would be the strategy of choice for several of the prevalent diseases such as ascariasis, enterobiasis and trichuriasis. New, single dose oral preparations provide high cure rates but it is almost impossible to eliminate reinfection. Although it is stated that personal cleanliness is essential and a rigorous preventive schedule is usually recommended in addition to treatment, this approach is probably useless and tends to enhance the psychological trauma of the infection. For example, enterobiasis has not been controlled by the most stringently applied sanitary measures, including daily thorough cleansing of each room of the house, daily changing and sterilization of bedclothes and night clothes, frequent brushing of nails and two showers per day (Warren, 1981). Furthermore, in spite of highly effective single dose antehelminthic therapy, reinfection occurs frequently. Thus, in one study, when three doses of drug were administered to families at spaced intervals to prevent reinfection, the prevalence of infection was slightly reduced four months after treatment. At the population level, the uncontrollable desire is to cure all patients and eradicate infection in the community. This will lead to highly expensive multiple approaches which surely will fail. So, treating the patients at a reasonable cost would be what we need to exercise.

There should be constant surveillance of water quality and sanitary inspection of water supply and waste disposal facilities. Health agencies often do not assume this obligatory role. The staff need to supervise and inspect these amenities in defined and deficient areas. Adequate water supply and sanitation should be provided for the rural population. If substantial health benefit to a community is to be achieved then it would be important to integrate water supply, sanitation and health education.

There should be adequate control by appropriate agencies to prevent immigration of rural poor (population exodus) to the town areas thereby, creating shanty slum areas and squatters. There should be adequate provision of flats or low cost houses within the city to absorb exodus of population coming in.

Water-borne infections such as amoebiasis, cholera, typhoid and giardiasis are common because of the absence of safe drinking water, primitive methods of food storage and insanitary handling, resulting in faecal contamination of food. In this situation, health education should be continuously carried out to educate the community on the bad effects of indiscriminate defaecation and lack of personal hygiene.

A large number of different microorganisms have been confirmed as producing allergic responses such as asthma, fungus infections and dust mites in humans. A number of contagious diseases are capable of air-borne transmission in the indoor environment. These are influenza, legionnaire's disease, tuberculosis, measles, mumps and chicken pox. Owing to respiratory diseases being one of the major contributory factors to overall acute morbidity, airborne transmission of contagious agent needs close monitoring. Thus, to control respiratory tract infections, houses should have proper ventilation and the indoor environment has to be maximized. The public health aspect of indoor spread (secondary attack rates) in families and in school populations is an area of concern.

Pets such as cats, birds and dogs living within the vicinity of the home environment are notoriously harmful if they are not regularly dewormed or treated for infections and diseases. We should bear in mind that there are over hundreds of diseases that are transmissible between these animals and man. Most of them are transmitted via the faeces, sputum, urine and discharges to the soil, anal oral contact by fingers of children and infants and brushing of coats of animals in fondness and as an expression of love. Infected animals should be killed before they pose any danger to the society, particularly children and infants.

From these discussions, it is imperative that participation of the public is fundamental to the solutions of environmental health problems, particularly diseases encountered in poverty stricken areas. Good sanitation, whether personal, environmental or food, should be the primary aim of the community so that the morbidity and mortality of diseases can be reduced. The development of environmental health activities that encompass the above, demands patience, vigilance and understanding. Health education is thus essential and is the key to success. The outcome of good sanitation can be measured by the health status and development of the children.

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Nutrition and Child Development

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1. Introduction

Growth and development depend on both the genetic or hereditary background of the individual and the physical and cultural environment to which he is born. Good nutrition and freedom from disease determine whether an individual attains his or her potential in life. A poor environment which provides inadequate nutrition, can prevent an individual from reaching his full genetic potential not only in terms of size and strength but also in terms of cognitive development.

Physical growth may be defined as an increase in the size of an individual as measured by changes in weight and/or height. Growth occurs continuously from conception to full maturity but it is not a uniform process.

Development refers to the progressive increase in the capacity to function, both physically and mentally, and is closely associated with growth.

Each individual has his own rate of growth and development. The nutritional requirements of the child vary with age, growth rate, maturational stage, physical activity, the efficiency of absorption and utilisation of the nutrients.

Optimal growth and development depend more on adequate nutrition than any other factor. Since the beginning of life to the time the child becomes an adult, the food he eats and his ability to convert it into energy and new body tissues, will influence his health not only as a child but throughout life.

2. Dietary Requirements

In Table 1, the Recommended Dietary Allowances (RDA) for infants and preschool children are presented. During the first year of life there is rapid growth so the requirement for most nutrients, except for the B vitamins and ascorbic acid, is higher compared to later years.

Energy requirements can be defined as the level of energy intake (calories) from food that will balance the energy expenditure in healthy people. For children, the energy cost of growth has to be added.

The functions, deficiency signs and sources of vitamins and minerals are listed in Tables 2, 3, 4 and 5.

Table 1: Recommended Dietary Intake of Infants and Preschool Children

Nutrients	Requirements		
	< 1 Year	1-3 Years	4-5 Years
Calories	112.0	1360.0	1890.0
Protein (g)	2.3-2.0 per kg	23.0	29.0
Calcium (mg)	550.0	450.0	450.0
Iron (mg)	10.0	10.0	10.0
Vitamin A (mcg)	300.0	250.0	300.0
Vitamin D (mcg)	10.0	10.0	10.0
Thiamine (mg)	0.4	0.5	0.7
Riboflavin (mg)	0.6	0.8	11.0
Niacin (mg)	6.6	9.0	12.1
Folic acid (mcg)	50.0	100.0	100.0
Vitamin B12 (mcg)	0.3	0.9	1.5
Ascorbic acid (mg)	20.0	20.0	20.0

Table 2: Summary of Fat-Soluble Vitamins

Vitamin	Function	Results of Deficiency	Food Sources
A (retinol)	Vision cycle adaptation to light & dark	Night blindness Xerophthalmia	Retinol (animal liver, egg yolk, cream butter or fortified margarine & whole milk)
Provitamin A	Tissue growth esp. skin & mucous membranes	Susceptability to epithelial infections: changes in skin & membranes & in tooth formation	Carotene (plant foods) green & yellow vegetables & fruits
D (calciferol)	Absorption of calcium & phosphorus calcification of bones, toxic in large amounts	Rickets Faulty bone growth, poor tooth development	Fortified or irradiated milk, sunshine, fish oils
E (tocopherol)	Antioxidant-protection of materials that oxidise easily, normal growth reproduction (in animals)	Protection of Vitamin A & unsaturated fatty acids, breakdown of red blood cells, anemia, sterility (in rats)	Vegetable oils, Vegetable greens
K (mendadione)	Normal blood clotting	Bleeding tendencies, hemorrhagic disease	Green leafy vegetables, cheese, egg yolk, liver, intestinal bacteria synthesis main source

Table 3: Summary of Vitamin C (Ascorbic acid)

Functions	Clinical Applications	Food Sources
Intracellular cement substance; firm capillary walls & collagen formation, helps prepare iron for absorption & release to tissues for red blood cell formation	Scurvy (deficiency disease), sore gums, hemorrhages, esp. around bones, tendency to bruise easily, stress reactions, growth periods, fevers & infections, wound healing, tissue formation, anemia	Citrus fruits, tomatoes, cabbage, potatoes, strawberries, melons, chilli peppers, broccoli, chard, turnip greens, green peppers, asparagus

Table 4: Summary of Selected B-Complex Vitamins

Vitamin	Function	Results of Deficiency	Food Sources
Thiamine (B1)	Normal growth coenzyme in carbohydrate metabolism; normal function of heart, nerves & muscles	Beri-beri *G1: loss of appetite, gastric distress, indigestion, deficient hydrochloric acid *CNS: Fatigue, neuritis, paralysis *CV: Heart failure, edema of legs	Pork, beef, liver, whole or enriched grains, legumes

to be continue next page

Table 4, continued

Vitamin	Function	Results of Deficiency	Food Sources
Riboflavin (B2)	Normal growth & vigor, coenzyme in protein & energy metabolism	Ariboflavinosis, wound aggravation, cracks at mouth corners, Glossitis (smoothness of tongue), eye irritation & sensitivity to light, skin eruptions	Milk, liver, enriched cereals
Niacin (nicotinic acid) precursor: Tryptophan	Coenzyme in energy production, normal growth, health of skin, normal activity of stomach, intestines & nervous system	Pellarga, weakness, lack of energy & loss of appetite, skin: scaly, dermatitis *CNS: neuritis, confusion	Meat, peanuts, enriched grains
Folic acid	Growth & development of red blood cells	Certain types of anemia, Megalobastic (large immature red blood cells)	Liver, green leafy vegetables, asparagus, eggs
Cobalmin (B12)	Normal red blood cell formation, nerve function & growth	Pernicious anemia, B12 is necessary extrinsic factor which combines with intrinsic factor of gastric secretions for absorption	Liver, meats, milk, eggs, cheese

* Key: GI - **Gastrointestinal**
CV - **Cardiovascular**
CNS - **Central Nervous System**

Table 5: Summary of Some Essential Minerals

Vitamin	Function	Results of Deficiency	Food Sources
Calcium (Ca)	Bone formation, tooth formation, blood clotting, muscle contraction & relaxation, heart action, nerve transmission	Rickets, Porous bones, poor tooth formation, Slow-clotting blood, tetany, Decrease in free serum calcium	Milk, cheese, green leafy vegetables, whole grains, egg yolk, legume, nuts
Phosphorus (P)	Bone formation, Overall metabolism of carbohydrate & fat	Rickets, Poor growth	Milk, cheese, meat, egg yolk, whole grains, legumes, nuts
Iron (Fe)	Haemoglobin formation, Carrying oxygen to cells for oxidation of nutrients to produce energy	Anemia, poor growth, Inability to meet demands of pregnancy	Liver, meats, egg yolk, whole grains, enriched bread & cereal, dark green vegetables, legumes, nuts
Iodine (I)	Synthesis of thyroid hormone, which regulates basal metabolic rate, Cell oxidation	Goitre, Impaired metabolic rate	Iodized salt, seafood

2.1 Nutrients

Calories

Since the body grows faster in infancy than at any other time of life the energy (calorie) requirement per kilogram body weight is about three times that of an adult. The total caloric needs of an infant increases from month to month. In the first three months, 25% of the calories are used for growth while at 9 to 12 months only 6% are used for growth. At birth, a baby needs 350 to 500 calories and at one year, from 800-1200 calories are needed. At birth, milk provides all the daily caloric needs.

Protein

The need of protein of an infant is also higher per kilogram basis than that of an older child. Nitrogen (from protein) is required for the formation of new tissues, maturation and maintenance of tissues. The protein need of an infant is met through human milk which contains all the essential amino acids for growth or through milk formulas designed to simulate human milk. The utilisation efficiency of protein in human milk is 100%.

Fat

Dietary fats become an important energy source after birth. Breastfed infants obtain 40% to 50% of his caloric intake from fat in human milk. Besides being a source of concentrated energy, fat provides structural components of many body tissues and is needed for the absorption of fat soluble vitamins and spare protein. It is also essential for the synthesis of steroid hormones.

Carbohydrate

Carbohydrates supply the greatest percentage of calories and form bulk of the diet. The main function of carbohydrate is to supply readily available energy for heat and muscular work. It also spares protein and exerts an antiketogenic effect by sparing rapid utilisation of fat. Carbohydrate not utilised or stored as glycogen is converted into fat and stored in the various fat depots.

Minerals

The child requires at least 12 minerals in proper amounts for the formation of new tissues and body fluids. Calcium is an important material for the structure and growth of bones and teeth. The amount required is more during infancy than in other age groups.

Iron is needed for haemoglobin synthesis. The absorption of iron is higher in infants than in older children. This is related to a greater need in early life. Zinc and copper are two additional minerals related to iron in the growth process.

Vitamins

They are essential for normal growth and development. A well-rounded diet usually supplies adequate amounts, but during infancy and nutritional disturbance, some should be supplemented.

3. Nutrition in Infancy

During infancy, the growth rate is rapid with the weight of the normal infant doubling by five to six months and tripling by one year. Energy and nutrients are required not only for maintenance of the bodily functions and activity but also in large amounts for tissue deposition. Both the qualitative and quantitative nutritional requirements are different from those of older children.

Nutritional status is directly related to the nutrition of the mother during pregnancy, inherited characteristics and the dietary intake of essential nutrients. Dietary inadequacies or restrictions may result in stunted growth and depressed brain and neurological development. Current evidence shows that the brain is most susceptible to malnutrition from -3 to +6 months of life. The effect of malnutrition on brain development is greatest and more permanent in the first few months. In many underdeveloped countries where infant mortality is high, nutritional status is poor due to an inadequate intake of essential nutrients at the appropriate stage of development.

The decision on the source of milk depends on a number of physiological, psychological and practical factors. Breastfeeding is strongly advocated for all mothers. Up to this moment of time, no alternative to breastfeeding has been found to be superior in supporting the growth and health of infants.

3.1 Breastfeeding

There is a wide agreement that breast milk is the most natural food for infants and is preferable to milk formulas. The nutritional and functional properties of milk are unique to each species, and human milk is very different from cow's milk, which is commonly used as a source for milk formulas. Jelliffe (1977) stated that cow's milk can, in no way, be humanized any more than human milk be bovinized. The advantages of breast milk over milk formula lie in its unique composition.

Breast milk and its precursor, colostrum, ensure the infant's adaptation and successful transition to an independent postnatal life. During the first few days after birth, colostrum is secreted by the mammary glands. This secretion is specially adapted to the needs of the baby. It contains less fat, lactose and water soluble vitamins than mature milk but more protein, fat soluble vitamins (A, E and K) and zinc. It is high in immunoglobin and a host of other protective factors which prevent the infants from infections. To get the beneficial effects of colostrum, infants should be put to the breast as soon as possible after birth.

Human milk has the lowest protein concentration among mammals but it is more than adequate for optimal growth in young babies and is compatible with the ability of the infant's kidneys to excrete excess nitrogen. Human milk's high whey:casein ratio results in the formation of a softer gastric curd which facilitates digestion. Taurine, an essential amino acid for the development of the central nervous system, is found in breast milk. It is found to be in higher concentration in the plasma of breastfed than bottlefed infants. The dominant bovine protein is one of the most common allergens to man and can cause allergy in babies.

Breast milk contains three to four times more of the essential fatty acids for growth than cow's milk. It is rich in long chained polyunsaturated fatty acids which are important to brain development. Breastfed infants are absorbing and digesting fat better than artificially fed infants because of the presence of two human milk lipase.

Lactose which is a natural sugar is found only in milk and human milk contains the highest concentration. It contributes about 40% of the infant's energy needs. Lactose is metabolised into glucose for energy and galactose needed for the development of the central nervous system. It facilitates calcium and iron absorption and promotes intestinal colonization of *Lactobaccillus lifidus* which inhibits the growth of pathogenic bacteria, fungi and parasites. The incidence of bacterial infections and gastro-intestinal illness has been found to be lower in breastfed infants.

Vitamin concentrations in breast milk are almost always adequate for infant requirements although they can vary with maternal intake.

It should be noted that when vitamin D supplement is inadequate, calcium and phosphorus absorption from human milk is greater. Therefore, rickets is less common in breastfed babies.

Mineral contents which are lower in human milk than in any milk formula are better adopted to the infant's nutritional requirements and metabolic capacities.

Calcium in human milk is more efficiently absorbed because of its high calcium-phosphorus ratio (2:1).

Iron deficiency anemia is very rare in infants fed on only breast milk during the first 6-8 months. Healthy infants born to well-nourished mothers have sufficient iron stores to last for at least four months. The form of iron in human milk is specially well absorbed (American Academy of Paediatrics, 1978). Up to 70% of breast-milk iron is absorbed compared to 10% in milk formula.

Zinc is essential to enzyme structure and function, growth and cellular maturity. The amount of zinc in human milk is small but sufficient to meet the needs of babies without disturbing copper acid iron absorption; its bioavailability is high compared with zinc added to milk formula.

There are substantial differences between trace elements in human milk and milk formula. In general, breastfed infants are at little risk of either a deficiency or an excess of trace elements. Copper, cobalt and selenium levels are higher in human milk than in cow's milk. Copper deficiency, resulting in hypochronic microcythic anemia and neurological disturbance, occurs only in artificially fed infants.

Human milk not only provides unique protection against infections and allergies but it also stimulates the appropriate development of the infant's own immune system. The most apparent result is decreased infant morbidity and mortality compared with infants who are artificially fed. The protection afforded by breastfeeding is most evident in early life and continues in proportion to the frequency and duration of breastfeeding.

Lactation is the world's most significant contraceptive. The maximum birth-spacing effect is achieved when an infant is fully or nearly fully breastfed and the mother remains amenorrhoiec. Prolonged amenorrhoea also allows the mother to recover her iron stores which enhances her immune and nutritional status as well as prospects for providing adequate nutrition for future babies.

Besides providing a baby with his natural nourishment, breastfeeding helps to promote the bonding of mother and infant which is so important in the development of the young in all mammals.

The mother should always be encouraged to breastfeed, especially in poor social circumstances, as breastfeeding remains the only safe way to feed a baby. It is also the cheapest source of nutrients for infants.

3.2 Bottlefeeding

Although most women are able to breast feed, some for various reasons cannot. For these mothers, their babies have to survive on milk formula modified to approximate the composition of human milk. A good bottlefeeding is preferable to inadequate breast feeding. Bottlefeeding is acceptable, provided the mother has sufficient money to purchase enough milk formula, is educated and intelligent to follow the instructions for making up the preparation and has facilities in the home that are up to the required health standard.

3.3 The weaning period

The infant generally grows on milk supplemented with vitamins C and D until about four months when, due to growth and increased demand for energy, more food is needed. By four months, the iron reserve of the baby is almost finished so additional iron is required. More thiamine is also needed by this time. To meet these needs and the calorie requirements, additional foods are introduced. The World Health Organization has recommended that infants receive complementary food from four to six months.

Weaning process or the *transitional period* means the progressive transfer of the infant from breast milk to the usual family diet. The factors to consider are the types of food normally eaten at home or are easily available, the environmental conditions and the facilities to prepare and feed the child safely.

The complementary foods should provide a source of calories and all the necessary nutrients to which breast milk will be making a decreasing contribution. Particular attention should be given to proteins, iron, Vitamins A and C as these are frequently found deficient in the diet of infants. The introduction of cereals and particularly vegetables can interfere with the absorption of breast milk iron. Guidelines to show when complementary foods are to be given is shown in Table 6. New foods are given one at a time in half teaspoons. The amounts are gradually increased as the child learns to like them.

Although weaning can be started from four months, how long breastfeeding should be maintained depends on whether the family can afford milk powder, the mother can provide suitable, digestible and nutritious food and whether suitable food is available for the infants. In poor rural areas, mothers should be encouraged to breastfeed for up to 2 years as in this way she can at least provide the infant with small amounts of high-score protein.

The period between 6 months and 2 years is sometimes called the *danger period* as too often, especially in the poor regions, a predominantly carbohydrate diet with very little nutrients is given while, at the same time, the child's immunity is at its lowest.

In this country, the use of precooked cereals is widespread among all children (Chen, 1978). This practice should be discouraged especially in the lower income group as it is expensive. Table 7 compares the nutritional value and cost of home-cooked balanced meal to that of a precooked cereal meal.

Table 6: Guidelines for Addition of Solid Food to the Infant's Diet During the First Year

When to start	Food added
Fourth month	Fine cereals (preferably home-cooked) and strained cooked fruit. Egg yolk - soft boiled
Fifth to sixth month	Strained cooked vegetables, pureed meat and fish porridge
Seventh to ninth month	Toast, finely chopped meat, liver, eggs and fish, soft fruit and vegetables
Tenth month to one year	Soft rice with suitable foods

4. Nutrition in Childhood

After the rapid growth of the first year, the rate of gain slows down and the growth pattern changes from the beginning of the second year. He is now growing more slowly and needs less food for growth. The gains in height and weight are small compared to those of infancy and adolescence.

The Basic Four Food Plan (milk and dairy products; meat and fish; fruits and vegetables and breads and cereals) should be used as a basis for planning the child's diet during the preschool period.

During this period a variety of food is needed in the diet. Over emphasis on any one food may interfere with the nutritional adequacy of the diet. At this time, calorie needs are not high. The emphasis is on key nutrients such as protein, minerals and vitamins to maintain the growth pattern. There is more deposit of minerals for strengthening the bones to support the increasing weight than lengthening them. Physical growth continues in spurts.

Milk, even though a source of calcium, protein and fat, should not be taken to the exclusion of other essential foods. Three cups of milk per day should be sufficient to meet these needs. Sometimes, excess milk intake may exclude other solid foods from the diet and as a result, the child may lack iron and develop *milk anaemia.* A variety of suitable foods should be given. However,

Table 7: Comparison of Cost of Precooked Cereal with a Well Balanced Home Cooked Meal

Nutrients	Type of Food		1/3 Daily Requirement of a 1 Year Old Child Weighing 10kg
	Home Cooked Food*	Precooked Cereal	
Calories	350.0	350.0	350.0
Proteins (g)	10.4	10.0	8.3
Iron (mg)	7.1	13.0	3.3
Calcium (mg)	361.3	370.0	150.0
Vitamin A (I.U.)	740.0	1000.0	500.0
Thiamine (mg)	0.3	0.8	0.2
Niacin (mg)	6.9	4.6	3.0
Vitamin C (mg)	56.0	85.0	7.0
Cost	0.34	0.82	-

* 50g raw rice (1 small Chinese bowl), 20 pieces small dry ikan bilis (15g raw), 30g spinach, 1 slice papaya and 5.0g cooking oil

NB: *Adapted from Chen (1978)*

refined sugar is to be avoided as it can lead to dental caries. Table 8 shows the type of food and average serves for different age levels. In affluent society, care must be taken not to overfeed the child as this will lead to obesity which can cause health problems in later life.

During this time the child's mental capacities are developing and he is doing more thinking and exploring his environment. The toddler whose physical and psychosocial needs have been fulfilled by understanding and able parents will have both the physical and psychological readiness for preschool. The guiding principles for parents are to provide a variety of nutritious food for physical needs and the *climate* to promote and support social and emotional growth.

Table 8: Food Intake for Good Nutrition According to Food Groups and Average Size of Serving at Different Age Levels

Food Group	Average size of servings		
	Servings per day	1 - 3 yrs	3 - 6 yrs
Milk	3 - 4	1/2 - 3/4 cup	3/4 cup
Meat group (protein food)	at least 3		
Egg		1 egg	1 egg
Lean meat, fish, poultry (liver once a week)		1 - 2 tbsp	3 - 4 tbsp
Peas, dhall, nuts, soya bean products		1 tbsp	2 tbsp
Fruits & vegetables	at least 4		
Fruits		1/4 - 1/2 fruit (1 small slice)	1/2 - 1 fruit (1 med. slice)
Vegetables (green or yellow)		1 - 2 tbsp.	2 - 3 tbsp.
Cereals (whole grain or enriched)	at least 3		
Bread		1 slice	1 - 2 slices
Cooked cereals (rice, noodles, etc.)		1/2 - 1 bowl	1 - 1 1/2 bowls
Fats & carbohydrates to meet caloric needs			
Butter, margarine, oils		1 tbsp.	2 tbsp.
Biscuits		2 - 4 pieces	4 - 6 pieces

The important consideration in the growth of children and the best advice that can be given to parents is that children are individuals. Thus, growth and development occurs with wide variance. Parents should avoid comparing one child with another and assuming that adequate development is not taking place when the rate does not follow that of the other child. General measures of development are related to physical, mental, emotional and social growth.

Some general evidences of good nutrition are a well-developed body, average weight for body size and good muscles. The skin is smooth and clear, the hair glossy and the eyes are clear. Posture is good and facial expression are alert. Appetite, digestion and elimination are good. The child has good attention span for his age and is not easily irritable. He is energetic, sleeps well and enjoys school.

5. Results of MCDS

5.1 Infant feeding practices

The aim of the Malaysian Child Development Study (MCDS) is to compare the infant feeding pattern in four sectors namely, the urban advantaged (UA), urban disadvantaged (UD), rural (RU) and estate (ES) sectors.

In Malaysia, studies have shown that in urban sectors the percentage of infants breastfed has always been lower than that in rural areas and smaller towns. The incidence of breastfeeding was low in the 1970's in urban areas. However, the gap in breastfeeding incidence between rural and urban sectors appears to have narrowed in the 1980's. In rural areas, the incidence of breastfeeding remains almost the same in the 1970's and 1980's (Table 9).

Results of the MCDS show that the highest incidence of breastfeeding is in the estates, followed by the urban advantaged, rural and lastly the urban disadvantaged sector.

Significant ethnic differences in breastfeeding have always been observed. Malays have the highest proportion of breastfed infants which is followed by the Indians while the Chinese show the lowest level in earlier studies. The results from MCDS show a similar trend (Table 10).

The study of current breastfeeding pattern among the different ethnic groups in the different sectors discloses that the Malays in all the sectors have the highest prevalence (90%-95%) of breastfeeding (Ng, 1991). Their religious belief could be a factor contributing to the breastfeeding pattern. For the Malays, the percentage of breastfeeding mothers is higher in rural and urban disadvantaged sectors than in urban advantaged sector (Table 11).

An interesting pattern in breastfeeding has emerged among the Chinese mothers in recent years. A higher percentage of Chinese urban advantaged mothers (61%) breastfed their infants than their counterparts in the urban disadvantaged (35%) and rural areas (41%). This pattern was not observed in past studies (Teoh, 1975; Balakrishnan, 1977; Chen, 1978; Pathmanathan, 1978). This implies that education may play an important part among the Chinese. A decline in the incidence of breastfeeding by Chinese mothers is, however, seen in urban disadvantaged and rural areas when compared to a past study (Pathmanathan, 1978).

A different pattern is shown in the Indian sample. The highest incidence of breastfeeding is found in the estates which is probably due to economic reasons. Over the years more Indian mothers in urban advantaged communities have breastfed their children.

The duration of breastfeeding has decreased since the 1950's when 12 months was the mean in rural areas. The 1984-85 Population and Family Development Survey reported the mean breastfeeding duration for the urban and rural sectors to be 4 and 7 months respectively. In our Study, the mean was 7 months for rural areas, 3 months for both urban disadvantaged and estate sectors and 2 months for the urban advantaged. The Malays breastfeed the longest compared to the Chinese and Indians in all the sectors. The median duration of the Malays was 12 months in the rural areas, 6 months in the urban disadvantaged and 3 months in the urban advantaged areas. The

Table 9: Percentage of Infants Breastfed by Rural-Urban Sectors in Peninsular Malaysia, 1970 - 1986

Year of Study	Urban % (N)	Rural % (N)
1973 - 1974(a)	47 (1788)	78 (3837)
1984 - 1985(b)	80 (635)	80 (1166)
1987 - 1989(c)	69 (1251)	75 (1492)

Note: (a) Pathmanathan (1978)
(b) 1984 - 1985 Malaysian Population & Family Development Survey
(c) Malaysian Child Development Survey (1991)

Table 10: Percentage Range of Infants Breastfed by Ethnic Groups in Peninsular Malaysia, 1973 - 1989

Year of Survey	Malay	Chinese	Indian
1973-1990(a)	78% - 98%	17% - 50%	45% - 84%
1987-1989(b)	90% - 95%	35% - 61%	72% - 81%

Note: (a) Teoh, 1975; Pathmanathan, 1978; Chen, 1978; Wong, 1981.
(b) MCDS, 1991

Chinese in all the sectors practised the shortest breastfeeding duration, the median period being only 1 month. The median breastfeeding duration for Indians is 2 to 3 months.

In Malaysia, studies (Teoh, 1975; Balakrishnan, 1977; Chen, 1978; Pathmanathan, 1978; Khor, 1989) have shown that a high percentage of babies in rural and urban areas were given supplementary foods earlier than four months. Our Study shows that some mothers gave supplementary foods as early as 1 month. This is not a good practice as when supplementary foods are given too early there is less sucking which leads to diminished breast milk supply. Besides, unless the supplementary foods are suitably prepared for the babies, they would miss out on important nutrients essential for growth. Another danger is that unsanitary environments, poor education and unhygienic personal habits give rise to diarrhoeal diseases when complementary foods are given.

From our results, it appears that there are still mothers who are unaware of the importance of breastfeeding. Some of them are reluctant to breastfeed their infants because of lack of knowledge, confidence and support. Breastfeeding is considered to be troublesome, tiring, time-consuming and inconvenient to many, especially the working mothers. Other factors that might contribute to the reluctance to breastfeed are improved knowledge and upgrading of infant formula, impact of commercial propaganda, insufficient milk, mothers returning to work and embarrassment (due to the breast being considered a sex symbol).

5.2. Dietary Intakes of Preschool Children

A review of literature on nutrition from the seventies to the eighties shows that patches of mild to moderate malnutrition still exist in inland rural areas where communication is poor, in some estates and urban slums (Kandiah et al., 1977; Chong et al., 1984; Khor, 1988). Nutritional deficiency is mainly due

Table 11: Percentage Distribution of Infants Breastfed by Sector and Ethnic Groups in Peninsular Malaysia

	1970-1974(a)	1983-1986(b)
Urban Advantaged		
Malay	86 (N=166)	90 (N=142)
Chinese	17 (N=407)	61 (N=159)
Indian	45 (N=82)	79 (N=126)
Urban Poor		
Malay	89 (N=405)	93 (N=213)
Chinese	31 (N=626)	35 (N=97)
Indian	70 (N=306)	72 (N=122)
Rural Poor		
Malay	90 (N=2291)	95 (N=551)
Chinese	62 (N=755)	41 (N=226)
Indian	75 (N=755)	81 (N=295)

Note: (a) Pathmanathan, 1978
(b) MCDS, 1991

to inadequate intakes of calories, iron, calcium, vitamin A and the B vitamins which are often superimposed by the prevalence of parasitic infections like helminths and malaria.

From our Study, we get a picture of the trend of dietary intakes in urban advantaged, urban disadvantaged, rural and estate sectors. Undoubtedly, urban advantaged children fare the best in all nutrients intake while urban disadvantaged and rural sectors have almost similar patterns of intake. Generally, the estate group has the least satisfactory nutrient intake.

Recently findings from the studies using the 24 hour dietary recall method of food consumption of specific age groups have been reported. In general, most of the recent surveys revealed adequate intake of protein among preschool children in rural areas (Aminah et al., 1984; Zawiah et al., 1985; Karim et al., 1987). In our Study too, sufficient intake of protein by the majority of the children was noted. However, the protein quality consumed by the poor and the advantaged group differs. The latter derived about two-thirds of their protein (62%) from animal foods whereas more than 50% of the protein taken by the poor came from rice and other plant food (Table 12).

Nutrients found lacking in the diets of preschool children are mainly iron, calcium and niacin followed by calories. Although the pattern of deficiency is similar in all the sectors, the urban poor and rural had 2 to 3 times higher levels of deficiency than the urban advantaged for all nutrients. The urban advantaged group has only 24% of children deficient in iron, 29% in calcium and 28% in niacin, compared to 59%, 56% and 56% respectively for urban disadvantaged sector (Table 13).

In all the four sectors, the main sources of calories are rice and wheat products. This is followed by milk, sugar, fish, meat and to a lesser extent eggs, fruits, vegetables and dhall (in the estates). A few Indian children are vegetarian (Ng, 1991).

In all the sectors, Chinese children's dietary intakes are the most satisfactory while Indian children have the poorest food intake (Table 14). The findings of this study show that the children in the urban advantaged sector are the heaviest, tallest and healthiest while the estate children are the lightest, shortest and least healthy. These findings can be explained by their nutrient intakes. Overfeeding is noted in the urban rich group. About 8% of urban advantaged children are found to be obese.

Deficiency in the nutrient intakes of the urban disadvantaged, rural and estate children is highest in calories, iron, calcium and niacin. The differences reflect both the quantity and quality of the food taken by the children in these three sectors. These nutrients are found mainly in animal products (such as

Table 12: Protein from Food Sources by Sector (In Percentage)*

Sector	Animal, fish, milk	Others
Urban advantaged	62	38
Urban disadvantaged	45	55
Rural	48	52
Estate	36	64

* Data from MCDS

liver, meat, dairy products and nuts); some of these foods are rather expensive and is, therefore, not expected to be taken by children in the low socioeconomic status group. Although calcium is found mainly in milk, children in the poor sectors take mainly sweetened condensed milk which has a lower content of calcium than powdered milk. Lack of education in nutrition is another problem as cheap sources of nutrient rich foods are available.

*Table 13: Percentage of Preschool Children (3-6 Years) with Deficiency in Dietary Intake by Sector in Selangor and the Federal Territory, Malaysia, 1989**

Nutrients	Urban Adv. N=435	Urban Poor N=454	Rural N=534	Estate N=348
Calories	16	42	46	48
Protein	0	2	2	2
Iron	24	59	66	70
Calcium	29	56	55	68
Vitamin A	4	21	22	22
Niacin	28	56	59	56
Vitamin C	15	28	26	30

* Data from MCDS

6. Nutritional Status of Children

Malaysia has achieved considerable improvement in socioeconomic and health status of its people during the past quarter of a century. Yet, there are pockets of communities who still suffer from much ill-health and nutritional problems. Although severe nutritional problems such as Marasmus and kwashiorkor are not common, mild to moderate forms of protein-energy malnutrition (PEM) are prevalent in certain communities.

This section of the paper focuses on the nutritional status of Malaysian children in terms of birth weight and prevalence of protein-energy malnutrition.

6.1 Birth weight

Protein-energy malnutrition suffered before birth is manifested in low birth weight. World Health Organization defines birth weight that is less than 2.5 kg as low birth weight. Birth weight is an indirect indicator of the general

*Table 14: Iron and Calcium Deficiency by Race and Sector (In Percentage)**

Sector	Iron	Calcium
Urban Advantaged		
N	106	128
Malay	23	32
Chinese	25	28
Indian	26	28
Urban Disadvantaged		
N	257	241
Malay	63	58
Chinese	51	50
Indian	68	61
Rural Estate		
N	596	524
Malay	69	58
Chinese	62	50
Indian	71	68

* Data from MCDS

Table 15: Means and Standard Deviations of Birth Weight of Children by Sector

Birth Weight (m)	Total	UA	UD	RU	ES	F-ratio	P
mean	3043	3112	3028	3082	2775	31.81	0.00
s.d.	512	539	475	483	554		

Table 16: Incidence of Low Birth Weight by Sector

Birth Weight		Total	UA	UD	RU	ES
Low Birth	N	329	66	75	101	87
Weight	%	13.5	12.1	11.9	10.3	31.3
Normal	N	2101	480	555	875	191
	%	86.5	87.9	88.1	89.7	68.7

health and level of socioeconomic development of a community. Numerous studies, such as Hassan et al. in Lebanon (1969), Banik et al. in India (1970), Thomson (1962), and Chen (1983) in Malaysia, have shown that higher income families produce offspring with higher mean birth weights. Table 15 shows the means of birth weight of MCDS children by sector. It can be seen that the urban advantaged newborns are the heaviest, the estate children the lightest while the rural and the urban disadvantaged are intermediate. The incidence of low birth weight is also highest among the estate children (Table 16). Socioeconomically, the urban advantaged parents are the highest, many being professionals earning higher income than those in other sectors. Estate parents, being mainly rubber tappers, are economically the most deprived among these four communities. Consequently, it is not surprising that the estate children have the lowest mean birth weight. Educationally and occupationally, there are little differences between urban disadvantaged and rural parents. The little difference in birth weight between the children in these two sectors and their intermediate position between the urban advantaged and estate children are further evidence of the relationship between economic status and birth weight.

The birth weight of an infant is influenced by the prepregnancy and nutritional status of the mother. Studies, for example, Geefhusyen et al. (1980), have shown that women less than 155 cm tall were more likely to produce small babies. Gopalan (1990) reported that Ghosh et al. (1972) in their studies in India observed a direct relationship between stunting in the mothers and the occurence of low birth weight in their offspring. However, recent studies of the Nutrition Foundation of India among the poor communities inhabiting the slums of Bombay, Calcutta and Madras showed that the incidence of low birth weight deliveries in women who started their pregnancies with body weights of 45 kg and above was substantially less than that in those who started their pregnancies with lower body weights (Gopalan, 1990). The study also showed that the infants of mothers who achieved a body weight of around 50 kg at the height of their pregnancy grew satisfactorily until at least the end of four months of infancy to achieve body weights exceeding 90% of the 50th percentile and lengths exceeding 98% of the NCHS Standard. They concluded that the mother's low body weight was a more important determinant of low birth weight in the offspring than low maternal height, and that even in the case of mothers who are significantly stunted, achievement of body weights of around 50 kg by the end of pregnancy could result in substantial reduction in the incidence of low birth weight.

Therefore, proper nutrition and health care of the mothers during their childhood and pregnancy and good antenatal care are essential in the prevention of low birth weight babies.

6.2 Malnutrition among preschool children

Review of studies conducted prior to 1960 in Malaysia shows that the more extreme forms of malnutrition were prevalent during this period. For example, a survey conducted in Perak in 1957 revealed that 19% of the Malay toddlers surveyed had kwashiorkor and 44% showed signs of protein deficiency. Almost all (95.5%) of them had Vitamin A deficiency while 14% had xerosis conjuctiva (Thomson, 1960). Studies in the sixties and seventies showed that moderate to severe malnutrition still existed, particularly in deep inland rural districts and certain rural urban slums. Table 17 summarises the findings of several surveys undertaken during this period. The predominant deficiencies found by these surveys were calories, protein, Vitamin A and iron.

Later studies in the eighties showed that mild to moderate forms of protein-energy malnutrition (PEM) are common. For example, Chen et al. (1981) and Chong (1982) did not find any child with kwashiorkor among 3,672 children in Sabah and 1,694 disadvantaged children in Peninsular Malaysia respectively and the prevalence of moderate forms of PEM ranged from 7% to 36%.

Table 17: Community Surveys on Malnutrition in Toddlers and Preschool Children (1975-1983)

Year	Age Group	Population Surveyed	Number	Malnutrition %
1957 (Thomson)	0 - 4 yrs	Malays in Lambor and Layang Layang	200	19% kwashiokor, 44% signs of protein deficient diet
1961 (Thomson)	1 mth - 5 yrs	Children attending maternal and child health clinics in Perak	14,604	Weight curve drawn shows that all weights fall below English range, Boys heavier than girls, Chinese > Malays > Indians
1968 (IMR)	1 - 5 yrs	Malay children in Trengganu	207	48% significantly malnourished
1968 (Dugdale)	0 - 7 yrs	Malay children of soldiers in Malaysian army in Kuala Lumpur	660	10% significantly malnourished
1969 (IMR)	0 - 5 yrs	Malay children in Teluk Datok and in Kuala Langat districts in Selangor	475	10% significantly malnourished (<70% of Harvard standard)
1970	0 - 7 yrs	Malay children in Mukim Ulu Bernam in Ulu Selangor district in Selangor	425	0-5% (2 cases) marasmus, 25% mild to moderate malnutrition (boys), 8% nutritional dwarfs (boys), 38% mild to moderate malnutrition (girls)

to be continued

Table 17, continued

Year	Age Group	Population Surveyed	Number	Malnutrition %
1971 (Chan)	0 - 4 yrs	Paediatric inpatients in University Hospital	147	13% severe protein calorie malnutrition (<60% of expected weight for age), 65% underweight
1972 (IMR)	1 - 5 yrs	Malay pre-school children in Kuala Trengganu	285	23% significantly malnourished
1975 (Chong & LiM)	0 - 7 yrs	Malay pre-school children in Ulu Trengganu	209	32% significantly malnourished (<70% of Harvard standard)
1976 (Kandiah)	0 - 5 yrs	Indian children in rubber estates in Selangor	41	2.5% (1 case) marasmus, 20% significantly malnourished (<70% of Harvard standard)
1977 (Anderson)	0 - 9 yrs	Iban children in Sarawak	502	86.1% significantly malnourished, 9.6% severely malnourised, 76.5% moderate malnutrition, 68.1% stunted
1979-83 (IMR)	0 - 6 yrs	Malay pre-school children in Kelantan	635	3.0% severe chronic malnutrition, 5.0% acute malnutrition, 43.0% stunted, 37.0% underweight

Adapted from J.T. Arokiasamy, *Asia Pacific Journal of Public Health* (1990)

In the MCDS study, it is seen that a majority of the children (89%) are normal. Only a small proportion suffers from malnutrition which includes 3.8% *stunted with no wasting*, 3.0% *wasted with or without stunting* and 4.1% obese children (Table 18). *Stunting with no wasting* denotes past chronic undernutrition due to recurrent episodes of or prolonged protein-energy malnutrition and is referred to as *nutritional dwarf*; *wasting without stunting* indicates a recent period of acute protein-energy malnutrition; *wasting with stunting* shows acute or chronic PEM; and *obesity* denotes overnutrition of unknown duration.

The results of the MCDS also disclose that estate (ES) children have the highest rates for *nutritional dwarfs* (7.6%), and wasting with or without stunting (8.7%) while the lowest rates of *nutritional dwarf* (0.3%) and wasting with or without stunting (0.5%) are found among urban advantaged (UA) children. Rural (RU) and urban disadvantaged (UD) children's rates are intermediate, with the rates of rural children being lower than those of urban disadvantaged children. In short, the order of stunting and wasting is ES>UD>RU>UA. Urban advantaged children, on the other hand, have the highest rate for obesity (9.4%) and the estate children have the lowest (1.1%) while the rates of the rural and urban disadvantaged children are intermediate, being 3.2% and 2.7% respectively.

Other studies also show that PEM is more common among urban and rural poor (Table 19). Among urban advantaged preschool children, there was no significant PEM while among urban disadvantaged, the prevalence of significant underweight was 12% (weight for age below 70% or -2 S.D. of the reference median), stunting 5% (height for age below 90% or -2 S.D. of the reference median) and wasting was 1% (weight for height below 80% or -2 S.D. of the reference median). Among rural preschool children, the prevalence of significant underweight varied from 9% to 37%, stunting from 17% to 43% and wasting with or without stunting from 4% to 8%.

Up till the mid 1970's, most nutritional surveys focused on Malay preschool children, presumably because of a greater proportion of the rural population was composed of Malays. However, in 1976, a survey on the nutritional status of Indian children undertaken in all estates in Selangor by Kandiah and Lim (1977) showed that 20% of the Indian children were significantly malnourished, 41.1% were anaemic and 35% had Vitamin A deficiency.

The MCDS shows that the Malays (5.3%) and Indians (5.0%) have significantly higher rates for *nutritional dwarfs* than the Chinese (1.6%). As for wasting, the Indians have the highest rate (5.8%) which is followed by Malays (3.2%) and Chinese (0.9%). The Chinese have the highest rate for obesity (4.9%), with the Indians following close behind (4.5%). The lowest rate for obesity is found among the Malays (2.9%) (Table 20).

*Table 18: Nutritional Status by Sector (In Percentage)**

Nutritional status	Total (2728)	UA (594)	UD (665)	RU (1100)	ES (368)
Stunting with no wasting	3.8	0.3	3.0	4.9	7.6
Wasting with/ without stunting	3.0	0.5	3.5	2.3	8.7
Normal	89.0	89.7	90.8	89.6	82.7
Obese	4.1	9.4	2.7	3.2	1.1

* Data from MCDS

When the nutritional status is analysed according to sector (Table 21), it is seen that obesity and not PEM seems to be the problem with the urban advantaged children: 11.9% of the Indians, 9.0% of the Malays and 8.2% of the Chinese are obese.

Table 19: Prevalence of PEM among some Preschool Children in Malaysia

Percentage of children	Urban		Rural	
	advantaged Chen (unpublished)	disadvantaged Chong (1982)	disadvantaged Chen et al. (1981)	 Chong et al. (1984)
Underweight	0	12	9	37
Stunted	0	5	17	43
Wasted	0	1	4	5
Stunted and wasted	0	-	-	3

In the urban disadvantaged sector, there are statistically no significant differences in the rates for stunting, wasting and obesity among the three races.

Unexpectedly, the rural Malays and estate Indians have the same rates for stunting (7.6%) but the estate Indians have a much higher rate for wasting: 8.7% of the Indians compared to 3.6% of the Malays. The rural Chinese have the lowest rates for stunting (2.2%) and wasting (0.9%).

Malnutrition is also more common among children in large sized family. Chen (1977) found that children with a larger number of siblings had a significantly higher rate of underweight and stunting compared with those with less than four siblings.

Further, Chong et al. (1984) found a significant inverse correlation between the household size and per capita calorie intake. The MCDS also shows that the prevalence of PEM is correlated with the father's occupation and the number of living siblings and inversely correlated with the father and mother's educational level. However, these relationships are only significant for underweight and stunting (Table 22).

7. Aetiology of Protein Energy Malnutrition

The aetiology of PEM is multifactorial but results basically from 2 main sets of factors, namely a diet that is deficient in quantity and quality and superimposed stress usually of a microbial origin. A deficient diet may be due to economic factors such as poverty and high food prices, low production of

*Table 20: Nutritional Status by Race (In Percentage)**

Nutritional status	Total (2851)	Malay (1013)	Chinese (1125)	Indian (713)
Stunting with no wasting	3.8	5.3	1.6	5.0
Wasting with/without stunting	2.9	3.2	0.9	5.8
Normal	89.2	88.6	92.6	84.7
Obese	4.1	2.9	4.9	4.5

* Data from the MCDS

*Table 21: Nutritional Status by Sector and Race (In Percentage)**

Race	Total	Stunting with no wasting	Wasting with/without stunting	Normal	Obese
Urban Advantage					
Total	594	0.3	0.5	89.7	9.4
Malay	167	0.6	1.8	88.6	9.0
Chinese	267	0.4	0.0	91.4	8.2
Indian	160	0.0	0.0	88.1	11.9
Urban Disadvantaged					
Total	665	3.0	3.5	90.8	2.7
Malay	215	3.7	4.2	90.2	1.9
Chinese	272	1.8	1.8	93.8	2.6
Indian	178	3.9	5.1	87.1	3.9
Rural-Estate					
Total	1469	5.6	3.9	87.9	2.7
Malay	556	7.6	3.6	87.1	1.8
Chinese	544	2.2	0.9	92.3	4.6
Indian	369	7.6	8.7	82.7	1.1

* Data from the MCDS

cheap local food of high nutritive value, adverse socio-cultural beliefs and practices in the form of food taboos, and a lack of knowledge concerning the nutritive requirements of susceptible groups (such as children). Poverty, although an important contributory factor, is rarely the prime cause. The most important factor is the lack of knowledge concerning nutrition, in particular with regard to breastfeeding and a proper weaning diet. The weaning diet as a whole, is often unsatisfactory as it consists mainly of starch with very little protein, vegetables and fruits.

> The transition from milk to adult diet is sometimes abrupt and the young child is offered bulky adult meals that are overspiced, difficult to masticate, indigestible and spaced out over long intervals. As a result, the young child is only able to obtain a largely carbohydrate (rice) meal together with a little sauce or gravy from the main dishes - a diet that is deficient in protein, vitamins and minerals (Chen, 1970).

Moreover, a variety of food taboos deny a growing child essential protein and other foods, particularly at a time he needs them most. "For example, the rural Malay toddler is often denied fish, one of the few sources of protein available to him, in the mistaken belief that it is the cause of ascariasis" (Chen, 1970). Many foods which would otherwise be available to young children become taboo once the child develops an illness. For example, among rural Malays, certain normally accepted foods such as fruits and vegetables as well as mutton, beef, some types of fish, duck, prawn and chicken become taboo during illness (McKay, 1971; Wilson, 1971). Moreover, food restrictions and the cultural method of food sharing can contribute to undernutrition among young children. In many cultures, men who are the productive members of the group, have the first preference and the greatest share of the food prepared.

In addition to this, due to poor environmental sanitation, infections are common among the urban squatters and the rural poor. Long-term studies in impoverished traditional societies show the infection is the most important

*Table 22: Correlations between Home Factors and Malnutrition**

Prevalence of PEM	Occupation		Education Level		No. of siblings
	Father	Mother	Father	Mother	
Underweight	.07**	.02	-.06**	-.06**	.07**
Stunting	.09**	.03	-.08**	-.06**	.10**
Wasting	.04	-.01	-.01	-.05	.03

* Data from the MCDS

** p < .001

factor inducing malnutrition and growth retardation (Mata, 1990). High rates of infection are, in turn, determined by unfavourable social, cultural and economic conditions which predispose towards insanitation and poor personal hygiene. In exclusively breastfed babies, infections are rare or few. In bottlefed babies, infectious diseases, such as diarrhoea and respiratory infections, are common. For example, in a study among weaned children in a Guatemalan village, children had about seven episodes of infectious diseases per year in the first 3 years of life (Mata, 1978). Common infections induce anorexia, nutrient losses, metabolic alterations, hormonal imbalances and alterations to the immune function (Beisel, 1977; Beisel, 1975). These events may lead to wasting, stunting, acute and chronic malnutrition, and even death.

In infections, such as diarrhoea, measles, whooping cough and acute respiratory infections, food consumption is reduced, owing to anorexia. Food taboos and inappropriate treatment and feeding during convalescence further reduce energy and protein consumption. This is more significant in communities where food consumption by children is already poorer than the recommended requirement. In Malaysia, even among the higher income, well-nourished children, measles had an adverse effect on the nutritional status of 42% of those infected and it took 10 - 21 months before their weight returned to their previous percentiles (Chen, 1979).

The MCDS demonstrates also that the nutritional status is not influenced by ethnicity or genetic factors but is influenced by environmental factors. This is evident from the findings that there are no differences in the nutritional status of Malay, Indian and Chinese children in the urban advantaged as well as the urban disadvantaged sectors but differences are seen in the rural-estate sector. Estate sector has largely Indians. Parents of estate children have low income generating occupations and have low level of education. They also have larger family which means that the limited resources, including food, have to be shared by more members in the family. Moreover, the majority of estate mothers are working and children are left in the care of older siblings or in child care centres which are usually ill-equipped to take care of children. Therefore, estate children are more likely to receive inadequate nutrition and suffer from infectious diseases.

Iron deficiency anaemia is caused by an interaction between many predisposing factors. Common causes are:

a) **Inadequate diet** usually due to low food supply, erroneous feeding practices and low socioeconomic status.

b) **Poor absorption** due to low intake of available iron and unsuitable meal composition.

c) **Increased requirement** of iron, especially during the growth period, pregnancy and lactation.

d) **Blood loss** due to acute bleeding, chronic blood loss and worm infection.

e) **Infection** caused by poor environmental sanitation, poor health practices, or inadequate health care.

Besides protein-energy malnutrition, iron deficiency anaemia is another major nutritional problem seen in the children. Table 23 shows that the prevalence of anaemia (Haemoglobin less than 11 g/dl) ranged from 4% among the urban advantaged preschool children to 33% among the rural disadvantaged children.

8. Malnutrition and Development

Maternal malnutrition during pregnancy affects birth weight of babies. About 25-30% of infants born to undernourished mothers weigh less than 2.5kg, and about 4-10% weigh less than 2kg (Ghosh, 1972; Gopalan, 1962). Morbidity and mortality rates are much higher among children who are small for gestational age (SGA) than among those who are not. Studies have also shown that growth and development of the low birth weight infants are adversely affected. For example, Gopalan (1990) reported that a longitudinal study by Ghosh in India, demonstrated that infants with the initial handicap of low birth weight never fully recovered from their handicap and continued to grow

Table 23: Prevalence of Anaemia among some Preschool Children in Malaysia

Studies	Children with haemoglobin less than 11 g/dl	
	No.	%
Peninsular Malaysia		
Urban advantaged (Chen, 1983)	126	4
Rural disadvantaged (Chong et al., 1984)	512	33
Sabah (Chen et al., 1981)	795	20 - 31
Sarawak (Anderson, 1981)	339	27

in a lower growth trajectory. But, it is possible that since a great majority of SGA (small for gestational age) infants come from poor household, their poorer growth performance could be due to their substandard postnatal nutrition and not necessarily a reflection of their initial handicap of low birth weight. The author, in comparing the growth performance of SGA infants of both the poor and the relatively well-to-do households, found that in each income group, the growth performance of SGA infants was poorer than that of infants with normal birth weights in the same income group. Morley et al. (1968) observed that all of the 35% of a study cohort who were above the 75th percentile for body weight at birth moved to below this mark later in infancy. Other studies (Varkki et al., 1955) showed that birth weight had no bearing on the development of protein-energy malnutrition later in life.

It is not known whether malnutrition in the preschool period can affect subsequent growth of the child. Studies by National Institute of Nutrition in India (1979) have shown that undernourished rural preschool children continued to be short and underweight even in adolescence. However, the authors argue that it cannot be stated categorically that this is a consequence of early malnutrition. Nearly 20-50% of the households in communities like those studied subsist on diets poor in energy intake (National Nutrition Monitoring Bureau, 1975). Krueger (1969) had also stated that the physical stunting seen in some school-age children may not be attributable to early malnutrition. Therefore, it is not clear that malnutrition in infancy and early childhood leads to permanent stunting of growth.

There is a lot of literature on the effects of malnutrition on the development of the brain and mental functioning. However, there is little solidly based evidence to show that malnutrition per se causes mental retardation and even less to show that it causes permanent mental retardation. Ghosh et al. (1972) observed no handicap in infants either in motor and adaptive development or in social behaviour whereas other studies had suggested a different outcome (Brandt, 1978). Stein et al. (1972) studied 19-year-old children whose mothers were exposed to a comparatively short Dutch winter famine while pregnant. He found that the intrauterine malnutrition did not cause permanent mental retardation. Other studies have shown that children who suffered severe malnutrition during infancy and the preschool period had low IQs, poor learning ability and poor intersensory integration (Champakam, 1968; Cravioto, 1966). However, Korean orphans adopted by well-placed foster-parents were found to have no residual mental deficiencies (Winick, 1975). It appears, therefore, that environmental stimulation is an important factor in influencing behavioural and neurological development.

Powell et al. (1990), after reviewing several studies, concluded that an episode of severe malnutrition in early childhood superimposed on conditions of poor socioeconomic background increases the risk of long-term impaired intellectual functioning and behavioural disorders. Poor development associated with severe malnutrition can be ameliorated by providing enriched environment.

9. Overnutrition and Obesity

Overnutrition leading to obesity is emerging as a problem in the more affluent sections of the society. Overweight in adult life is associated with increased mortality rates and that there is an association between obesity and ischaemic heart disease, hypertension and diabetes mellitus (James, 1976). About one-third of adult obesity originates in childhood or adolescence which tends to persist into adult life. Hence, prevention during childhood is of major importance. The avoidance of excessive weight gain during pregnancy may play a role in preventing foetal overnutrition. Weight records of infants kept with the original aim of preventing underfeeding could be used to prevent overfeeding. Sensible eating habits should be established and physical activities should be encouraged during childhood and adolescence.

10. Prevention and Control of Malnutrition

Since aetiology of malnutrition is multifactorial, its prevention and control require multisectorial cooperation and participation. Provision of adequate nutrition to children, control of infections and education of the community are the most important measures in the prevention and control of malnutrition. This involves raising the socioeconomic and educational level of the community, provision of proper environmental sanitation, health care facilities and control of infections. The Government of Malaysia, through its socioeconomic plans, continues to improve living standards and quality of life of the poor and the educational level of its people. The emphasis on rural environmental sanitation has resulted in 97% of its urban population and 71% of its rural population with access to clean drinking water. Rural health care system of the Ministry of Health provides preventive and curative health services to a large proportion of its rural population. Spearheaded by the Ministry of Health, intersocial approaches to improve the health and nutritional status of the people have been undertaken.

Applied Food and Nutrition Programme (AFNP) and promotion of breastfeeding are two such examples of intersectorial participation. New innovative programmes are being carried out to reach the remote areas and to improve the availability of low cost technologies. One such programme is the GOBFF (Growth monitoring, Oral rehydration, Breastfeeding, Immunization, Female education, Family spacing).

A large proportion of the preschool children attend health clinics where their growth is monitored. The Ministry of Health is in the process of implementing home-based growth monitoring of children whereby parents will be able to detect growth faltering and take appropriate measures to correct it. Oral rehydration has already been implemented to prevent and cure dehydration due to diarrhoea. Immunization coverage of children has improved with the implementation of universal child immunization programme. With the intersectorial effort, breastfeeding among urban mothers has increased. While emphasising on the child health, improvement of maternal nutrition is not forgotten. A large proportion of the pregnant mothers attend antenatal clinics whereby their health and nutritional status are being monitored.

Health education and community participation are the essential activities carried out by various agencies to educate individuals, families and communities and to empower them to become self-reliant. With self-reliant communities and with social marketing of health technologies, it is possible to achieve the desired health and nutritional status of the people.

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Cognitive Development of Preschool Children

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I would not be surprised if a number of you had been asking yourself what is *cognitive development* and had wondered what I am going to present in this session. I must confess that when I was a student of psychology it took me some time to understand what *cognition* means. As psychologists love to use jargons you should not be too troubled by this term. In fact, many psychologists use the terms *cognitive* and *intellectual* interchangeably. However, if one goes into the technicality, these two terms do differ somewhat for *cognition* refers to mental activities and behaviour through which knowledge of the world can be attained while intelligence is much more difficult to define. Although *cognitive* and *intellectual* can be used interchangeably I prefer the term *cognitive* because it is not value loaded as *intellectual*.

I. Status of Cognitive Development of Preschool Children in Malaysia

Five tasks, classification, seriation, conservation, reasoning and problem solving, are identified to be basic to the cognitive development of children in the age range of three to six years of age. Classification which refers to the categorising of objects according to similarities, such as form, color, shape or some other criteria, is a cognitive skill necessary to vocabulary acquisition for identification of objects and labelling them. Seriation is the ordering of objects along magnitude dimensions, such as length, size, weight and quantity while conservation is the understanding that certain properties, such as quantity, volume and weight, remain invariant in the child's mind despite certain transformations, such as displacing the objects or changing their shapes. Seriation and conservation are essential to mathematical understanding whereas reasoning and problem solving are living skills and vital to effective living.

The tasks that were used to determine the status of cognitive development of preschool children in urban advantaged, urban disadvantaged, rural and estate sectors were 1 classification task, 3 seriation tasks, 5 conservation tasks, 3 reasoning tasks and 3 problem-solving tasks. A total of 3039 children were tested individually, using the clinical method.

1. Classification

Table 1 shows the mean score on the classification of three-, four-, five- and six-year-olds in the urban advantaged (UA), urban disadvantaged (UD), rural (RU) and estate (ES) sectors. The results indicate that, in all the sectors, the older the children the higher the mean score. In other words, a developmental trend in classification is present in preschool children.

Table 1: Classification by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	1.31	1.51	1.28	1.25	1.09	5.47	0.00
4	1.72	1.95	1.63	1.65	1.64	4.84	0.00
5	2.15	2.11	2.28	2.18	1.78	8.68	0.00
6	2.25	2.16	2.39	2.25	2.06	2.34	0.07

Maximum score = 3

To determine the percentage of children who have mastered the classification task, the two-thirds rule is applied, that is, to be considered to have mastered the classification skill, the child must score at least two out of the total score of three.

The percentage of the three- four-, five- and six-year-olds who have mastered the classification task is 45.5%, 61.4%, 79.2% and 83.5% respectively (Table 2). The data indicate that, for the total sample, almost half of the three-year-olds and more than 80% of the six-year-olds have mastered this skill. But, the percentages of mastery by these four age groups in the estate sector are much lower than the percentages in total sample, being only 28.0%, 56.6%, 62.8% and 68.6% respectively. The performances of the three- and four-year-olds in the urban advantaged sector are significantly better than their

Table 2: Classification: Percentage of Mastery by Sector and Age

Age (Yrs)	All	UA	UD	RU	ES
3					
N	787	232	198	257	100
	45.5	55.2	45.0	44.0	28.0
4					
N	784	203	180	272	129
	61.4	72.4	56.7	58.4	56.6
5					
N	906	167	215	419	105
	79.2	77.8	82.8	81.9	62.8
6					
N	491	102	122	232	35
	83.5	82.4	86.9	84.4	68.6

agemates in the other three disadvantaged sectors (urban disadvantaged, rural and estate). However, contrary to expectations, the two older groups (the five- and six-year-olds) in the advantaged sector score lower than their urban disadvantaged and rural agemates. This is due to the sudden jump in the percentage in the urban disadvantaged and rural sectors - from 56.7% and 58.4% of mastery to 82.8% and 81.9% respectively. The significant increase may be due to the kindergarten experiences as children in these two sectors enter kindergarten at the age of five. Unlike urban advantaged children, very few of them have preschool experiences before the age of five. Although estate children have preschool experiences even before the age of five, their performances on classification are behind the performances of their agemates in the other three sectors.

2. *Seriation*

The same pattern is discerned in the seriation data (Tables 3 and 4), that is, the older children have (i) a higher mean score in seriation and (ii) a higher percentage of mastery. However, there are two differences. Firstly, among the four sectors, the urban advantaged children have the highest score in every

Table 3: Seriation by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	0.50	0.22	0.17	0.46	0.16	4.27	0.01
4	0.87	1.39	0.24	0.94	0.49	11.46	0.00
5	1.54	1.25	1.25	1.56	0.85	15.90	0.00
6	1.97	2.27	2.39	1.88	1.70	6.39	0.00

Maximum score = 3

one of the four age groups. Secondly, the mean score and the percentage of mastery on seriation tasks are lower than those on classification tasks.

In the total sample, only 8.9% of the three-year-olds have mastered the seriation tasks. The percentage of mastery increases to 22.7% among the four-year-olds, 49.8% among the fives and 66.4% among the six-year-olds. The percentage of mastery among the urban advantaged children is much higher, especially among the older ones. Among the three-year-olds, 10.8% of the urban advantaged children have mastered the seriation tasks while the percentages in the urban disadvantaged, rural and estate children are 7.1%, 8.6% and 9.0% respectively whereas the respective percentages among the six-year-olds are 81.3, 68.6, 60.6 and 54.3 (Table 4). The gap in the mean score between urban advantaged and estate children increases from three to five years of age, the differences being 0.16, 0.49 and 0.85. But, at six, the difference drops slightly (0.70).

Another interesting observation is that the biggest difference between any two consecutive age groups is between the four- and five-year-olds in the urban advantaged, urban disadvantaged and rural areas while, for the estate, it is between the five- and six-year-olds. The data suggest that, except for the estate sector, the critical period for the mastery of the seriation skill is between four- and five-year-olds which corresponds to the transition from the preconceptual to the intuitive stage of cognitive development. The critical period for the estate children seems to be delayed by a year and this could be related to their physical and psychological environment as well as their physical health status. It should also be noted that the difference between the three- and four-year-olds in the urban advantaged sector is quite large, suggesting slightly earlier attainment of this skill among urban advantaged children.

Table 4: Seriation: Percentage of Mastery by Sector and Age

Age (Yrs)	All	UA	UD	RU	ES
3					
N	784	231	197	256	100
	8.9	10.8	7.1	8.6	9.0
4					
N	779	201	180	271	127
	22.7	30.9	16.6	25.1	13.4
5					
N	898	166	211	416	105
	49.8	61.4	48.8	51.3	27.7
6					
N	489	102	121	231	35
	66.4	81.3	68.6	60.6	54.3

3. *Conservation*

An examination of Tables 5 and 6 reveals the following features:

1. The mean scores of the children's performance on the conservation tasks are very low. The percentages of those who have mastered the conservation skill are expectedly low. Mastery is not observed in any of the three-year-olds while, of the six-year-olds, only 7.8%, 4.2%, 4.3% and 2.9% in the urban advantaged, urban disadvantaged, rural and estate children have mastered this skill respectively.

2. Although few of the preschool children have succeeded on the conservation task, the developmental trend is discernible.

3. The data show randomness in the success of the children on the conservation tasks. For instance, the mean score of the four-year-olds in the estate community is higher than the mean scores of their urban disadvantaged and rural agemates while the five-year-olds in the urban advan-

Table 5: Conservation by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	0.07	0.13	0.07	0.03	0.02	6.00	0.00
4	0.15	0.26	0.09	0.12	0.16	3.97	0.01
5	0.25	0.36	0.36	0.18	0.10	6.74	0.00
6	0.48	0.68	0.48	0.41	0.29	2.24	0.08

Maximum score = 5

Table 6: Conservation: Percentage of Mastery by Sector and Age

Age (Yrs)	All	UA	UD	RU	ES
3					
N	758	225	193	247	93
	0.0	0.0	0.0	0.0	0.0
4					
N	762	200	177	264	121
	1.0	0.0	0.0	0.0	0.0
5					
N	895	168	213	413	101
	1.9	2.4	5.1	0.7	0.0
6					
N	486	102	120	229	35
	5.0	7.8	4.2	4.3	2.9

taged and urban disadvantaged areas have similar mean scores. Furthermore, in the estate sector, the four-year-olds have higher mean score than the five-year-olds, while a higher percentage of mastery is found among the five-year-olds than the six-year-olds in the urban disadvantaged sector. The randomness is indicative that the acquisition of this skill is not within the cognitive repertoire of children below six years of age. Those who have accomplished the conservation tasks are the early developers or exceptionally bright ones. Some degrees of consistency observed are among the six-year-olds. Our finding is consistent with Piaget's[1] theory of cognitive development which states that conservation is available to children of ages seven or older.

4. *Reasoning*

The data displayed in Tables 7 and 8 indicate that among the three-year-olds, very few of them can reason. The mean scores of the children in the urban advantaged, urban disadvantaged, rural and estate sectors are 0.40, 0.18, 0.20 and 0.05 only. But, the ability to reason increases with age and by the age of six, the mean scores of the children in the four sectors have increased to 1.77, 1.40, 1.28 and 0.60 respectively. The developmental trend in reasoning ability of preschool children is very salient. The data also show sectorial differences in reasoning ability. Urban advantaged children are superior to their agemates in the other three more deprived sectors. Estate children are, without doubt, the least able in reasoning. The estate six-year-olds have lower mean score

Table 7: Reasoning by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	0.23	0.40	0.18	0.20	0.05	12.82	0
4	0.55	0.96	0.46	0.51	0.14	30.21	0
5	0.91	1.28	1.00	0.88	0.22	28.76	0
6	1.36	1.77	1.40	1.28	0.60	12.04	0

Maximum score = 3

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[1] Piaget's theory is the most well-known and comprehensive theory of intellectual development.

Table 8: Reasoning: Percentage of Mastery by Sector and Age

Age (Yrs)	All	UA	UD	RU	ES
3					
N	776	223	190	261	102
	5.1	9.8	2.6	4.2	1.0
4					
N	779	201	178	269	131
	14.2	29.8	7.8	12.6	2.3
5					
N	906	172	178	415	105
	28.1	44.2	29.9	26.8	2.9
6					
N	491	102	122	232	35
	46.8	63.7	50.8	41.8	17.1

(0.60) than the four-year-olds in the urban advantaged sector (0.96). The gap in reasoning ability between these two groups of children progressively widens with age as indicated by differences in their mean scores which are 0.35, 0.82, 1.06 and 1.17 for the three-, four-, five- and six-year-olds respectively.

The critical age at which the children in the four sectors attain mastery in reasoning also differs. For urban advantaged children, the mastery begins at four as evidenced by the sudden jump from 9.8% of mastery at three years old to 29.8% at four. As for urban disadvantaged and rural children, the mastery begins at five as demonstrated by the increase from 7.8% at four to 29.9% at five for urban disadvantaged children, and from 12.6% to 26.8% for rural children. As to be expected, estate children achieve mastery even later. Although there is a sudden leap at six years when the percentage of mastery increases from 2.9 at five to 17.1 at six, the percentage of the six-year-olds who have mastered reasoning is far below the percentages of reasoners in the other three sectors. Evidence of reasoning deficit in estate children is thus overwhelming.

These findings are not startling as estate parents are, socioeconomically, the poorest; of the four groups of parents (urban advantaged, urban disadvantaged, rural and estate), they have the least education and the lowest occupational status (Appendix A-D). Physically, the estate children are the shortest and lightest. Our parent questionnaire reveals that children in the urban advantaged sector tend to seek for explanations by asking the *how* and *why* questions, while those in the disadvantaged area, if they ever ask questions, tend to seek for information as the *what* questions are more prevalent.

5. *Problem Solving*

The pattern of the performance of children in the different communities on the problem-solving tasks is very similar to that of reasoning. From a scrutiny of Tables 9 and 10 and on comparing them with Tables 7 and 8, the following conclusions can be drawn:

a) Problem solving ability follows an obvious developmental trend.

b) In all the sectors, very few of the three-year-olds are able to solve problems.

c) Urban advantaged children have higher mean scores in all the age groups.

d) Very few estate children have mastered problem solving skill - even fewer than those who can reason. The percentage of problem solvers among the six-year-olds in the estate sector is 8.6% compared to 17.1% of reasoners.

Table 9: Problem Solving by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	0.16	0.23	0.12	0.16	0.07	3.79	0.01
4	0.49	0.70	0.44	0.52	0.17	11.73	0.00
5	0.90	1.08	1.07	0.91	0.23	22.51	0.00
6	1.21	1.66	1.31	1.11	0.29	17.27	0.00

Maximum score = 3

Table 10: Problem Solving: Percentage of Mastery by Sector and Age

Age (Yrs)	All	UA	UD	RU	ES
3					
N	769	220	189	260	100
	2.3	4.5	1.6	1.9	0.0
4					
N	774	200	180	265	129
	13.7	21.0	12.2	14.3	3.1
5					
N	898	171	215	407	105
	30.8	34.5	39.1	30.7	7.6
6					
N	487	100	121	231	35
	43.7	59.0	50.4	39.0	8.6

e) The gap in reasoning and problem solving between urban advantaged and estate children increases with age.

f) The critical age at which urban advantaged, urban disadvantaged and rural children master problem solving skill is the same as reasoning, that is, at four years of age for urban advantaged children, and five for urban disadvantaged and rural children. However, for estate children, the critical age of mastery of problem solving is not seen even at six years of age. It seems to be later because there is no sudden increase, even at six years of age. It may be quite likely that many of the estate children will never master this cognitve skill.

6. Cognitive Development

Cognitive development is a composite score of all its components which comprise classification, seriation, conservation, reasoning and problem solving. As to be expected, urban advantaged children score the highest while estate children the lowest (Table 11), implying that urban advantaged children are the most advanced in cogntive development while estate children are the

Table 11: Cognitive Development by Sector and Age (In Means)

Age (Yrs)	Total	Sector				F-ratio	p
		UA	UD	RU	ES		
3	2.30	2.94	2.10	2.13	1.59	16.45	0
4	3.82	4.97	3.38	3.77	2.71	25.40	0
5	5.78	6.73	6.29	5.76	3.29	38.26	0
6	7.30	8.56	7.59	6.97	4.80	17.22	0

Maximum score = 17

least. Urban disadvantaged and rural children, who differ very little from each other, are in the intermediate position. Our findings suggest that the cognitive development of preschool children is related to their parents' educational and occupational status for urban advantaged parents are educationally and occupationally superior to the other groups while estate parents have the least education and most of them are in the manual work category (Appendix A & B). There is little difference in the educational and occupational levels between urban disadvantaged and rural parents.

Table 12 which displays the percentages of the cognitive tasks completed successfully, does not present a good portrait of the status of cognitive de-

Table 12: Percentage of Cognitive Development Tasks Completed Successfully by Sector and Age

Age (Yrs)	Total	Sector			
		UA	UD	RU	ES
3	13.5	17.3	12.3	12.5	9.4
4	22.5	29.2	19.9	22.2	15.9
5	34.0	39.6	37.0	33.8	19.4
6	42.9	50.4	44.6	41.0	28.2

velopment of preschool children. The highest percentage of the cognitive tasks successfully completed is only 50.4% which is attained by the six-year-olds in the urban advantaged community. The most depressing picture is the estate sector. Even at age six, only 28.2% of the cognitive tasks have been accomplished successfully. In spite of enjoying better facilities, both at home and in preschools, urban advantaged children are not much ahead of their urban disadvantaged and rural counterparts. In fact, many of the differences in their performance on the various cognitive tasks are not significant.

7. Summary

In summary, our research findings on the status of cognitive development of preschool children in Malaysia indicate:

a) The majority of the preschool children, even the three-year-olds, are able to classify.

b) Although only a small group of the three-year-olds (less than 10%) can seriate, the majority of the six-year-olds have mastered this cognitive skill.

c) Few of the preschool children can conserve. With a few exceptions, even the six-year-olds have not attained this skill.

d) Similarly, few of the preschool children are reasoners and problem solvers at three years of age but the number increases with age until almost 50% of the six-year-olds have mastered these skills.

e) The critical period for the preschoolers to master the five cognitive skills varies, not only for the various types of cognitive skills but also for the different sectors. For seriation and reasoning, the critical age tends to be four for the urban advantaged children, five for the urban disadvantaged and rural children, and six for estate children. The critical age for the mastery of problem solving skill is the same as that for reasoning in all the sectors, except for estate children. For these children, the critical age is beyond six years. As for classification, the critical age is not observed. It is highly possible that it is younger than three. The data suggest that unfavourable and unstimulating environment can delay mastery of cognitive skills.

f) Urban advantaged children are the most advanced in cognitive development and demonstrate greater mastery of the cognitive skills while the reverse is true of estate children. Rural and urban disadvantaged children do not differ significantly in cognitive development and they are in the intermediate position. The relationship between children's level of cognitive development and the educational and occupational status of parents is implied by the findings.

g) The gap in the higher order of cognitive skills (that is, reasoning and problem solving) between urban advantaged and estate children widens with age.

II. Relations with Other Areas of Development

The relationships of cognitive development with physical, language and socioemotional development will be examined because parents and preschool teachers often do not realise the inter-relatedness of the various areas of development.

1. *Physical Development*

Numerous studies (Brockman & Ricciuti, 1971; Freeman et al., 1977; Hertzig et al., 1972; Monckeberg et al., 1972; Richardson, Birch, & Hertzig, 1973) have found malnourished children to be significantly lower in mental abilities than nourished children. Although the malnourished children eventually caught up in physical growth, they continued to suffer from deficit in cognitive and behavioural functions. The mental deficit of malnourished children is often manifested in their school performance.

Malnutrition in children is expressed as underweight, stunting and wasting. Powell and Grant-McGregor (1985) found stunted and underweight children to be significantly inferior to normal children in development quotient. In contrast, Pollitt, Mueller and Leibel (1982) discovered wasting to be the only physical factor capable of explaining a significant portion of the IQ variance.

Low birth weight is intrauterine undernutrition. Wiener et al. (1965) found low birth weight to be associated with lower IQs. Since the growth and development of the central nervous system is at its peak during the last trimester of intrauterine existence, inadequate maternal nutrition may affect the development of the brain adversely (Birch, 1972).

To study the relationship between physical and cognitive development, the nutritional status of the subjects is examined. Stunting (height by age), wasting (weight by age), underweight (weight by height) are used as indices for identification of malnutrition among the subjects. The fourth index, low birth weight, is intrauterine malnutrition.

The data displayed in Table 13 indicate that normal children score higher on the cognitive tasks than their malnourished agemates, but only stunted and underweight children score significantly lower on the cognitive tasks than their normal peers. Thus, the findings indicate that stunting and underweight, and not wasting, are related to cognitive development. Stunting is chronic and

Table 13: Nutritional Status and Cognitive Development

Nutritional Status	Cognitive Development	Nutritional Status	Cognitive Development
Stunting	2.90	Wasting	3.50
Normal	3.93	Normal	3.91
Probability	0.01	Probability	0.37
(N = 108)		(N = 91)	
Underweight	2.92	Low Birth Wt	3.71
Normal	4.30	Normal	4.03
Probability	0.00	Probability	0.22
(N = 94)		(N = 213)	

NB Stunting = below 90% of standard height
Wasting = weight for height below 80% of standard height
Underweight = below 70% of standard weight
Low Birth Wt = < 2500 grams

long-termed malnutrition while underweight can be either chronic or acute. Wasting, on the other hand, is acute. These findings suggest that cognitive development is more likely to be linked to chronic than acute malnutrition. It can also be concluded that the cognitive deficit of low birth weight children is not significant. Three reasons can be put forward to explain the nonsignificant difference in cognitive development between low birth weight and normal children. Firstly, the malnutrition is not significantly severe for its impact on brain development to be felt. Secondly, the initial mental deficit may be offset by proper child care. Lastly, the mental development of children with normal birth weight may have been retarded by improper child care and lack of mental stimulation.

2. *Language and Socioemotional Development*

Many Malaysian parents who are anxious to give their children a headstart, are teaching their children to read as early as possible; some begin as young as two years old and some even younger, while the child is still in the mother's womb. This practice is based on the assumption that language is a necessary tool to thinking and intellectual development. This viewpoint is derived from the Sapir-Whorf hypothesis which is restated by Fishman (1960) as "The characteristics of language have determining influences on cognitive growth".

However, Piaget (1960) holds the opposing viewpoint and believes that language is structured by logic or intellectual operations but he does admit that language may facilitate cognitive growth. The child has to have the necessary cognitive schemata or structure to enable him to use the words meaningfully, especially to solve problems. The solution could have been nonverbal and the words are used merely to express his thoughts (Blank, 1974). Proponents of Piaget believe that the primary prerequisite to language acquisition is the capacity for mental representation which is the climax of the sensorimotor stage of intellectual development (Corrigan, 1979). Anastasiow and Hanes (1974), in investigating the cognitive and language acquisition of three subcultural groups, concluded ". . . the cognitive development remains a significant factor for language acquisition" (p. 708).

Between the opposing views of Sapir-Whorf and Piaget lies Vygotsk (1962) who maintains that language and thought originate from different roots and they gradually merge together as the child approaches the preoperational stage, but the fusion of thought and language is never complete. Although these three theories have different implications for child rearing and educational practices, our purpose is not to gather research evidences to support one theory or disprove another. We are merely attempting to establish the degree of relationship between cognitive and language development.

Many psychologists believe that there is a link between cognitive and socioemotional development. Interests in the relationship between emotion and cognition are fairly recent. Barenboim (1977), Berndt and Berndt (1975), Miller, Kessel and Flavell (1970), Peterson, Danner and Flavell (1972) and Selman (1971) are among those interested in these social-cognitive problems. Schachter believes that cognition and arousal are highly interrelated. People's feelings are affected by what they know. He and Singer (1962) injected suproxin (a supposed vitamin compound) into three groups of subjects who were given different information. One group was told of the side-effects which might last up to 20 minutes, another was told the compound was quite harmless and another was purposely misinformed by the experimenter and physician of the side effects such as body itches and headaches. Although none of them was injected with the compound, yet they felt the symptoms, depending on what they had been told. Not everyone agree with his theory but his studies have generated numerous research into the relationship between emotion and cognition.

Table 14 shows that the correlation between cognitive and language development is 0.57, indicating that the common variance between them is 32%. This finding suggests that there is some relationship between cognitive and language development but we have no means of determining whether language development is influencing cognitive development or vice versa. However, we observed that children were unable to do the Piagetian tasks unless

Table 14: Correlations Between Cognitive, Language and Socioemotional Development

	Cognitive
Language	0.57
Social	0.14
Emotion	0.41
Empathy	0.51

All the correlations are significant at .001

they had understood the instructions. However, it is also highly possible that, for children to understand the instructions, certain cognitive structures are essential.

The data presented in Table 14 also show that recognition of basic emotions and ability to empathise correlate quite highly with cognitive development. The correlations are .41 and .51 respectively. These correlations are, however, lower than the correlation between cognitive and language development. The correlation between social and cognitive development is only .14. Thus, cognitive and social development have less than 2% of commonality between them.

The findings suggest that the more advanced the cognitive development, the greater is the child's ability to recognise emotions and the more empathetic he is. However, the empirical evidence of this study does not support the common belief that the higher the sociability of the child, the greater his cognitive development.

3. *Personality Traits*

Personality traits (such as motivations, persistence and anxiety) have long been postulated to play an important role in academic attainment. In this study, we are only interested in those personality traits that are observable while the child is working on a task. Thus, approach behaviour, impulsive-reflective behaviour, need for encouragement, shyness and attention span are selected for investigation.

Of these five personality traits, only impulsivity-reflection has been extensively investigated. According to Kagan, impulsivity is a consistent and relatively stable personality trait that is even evident in two-year-old children. He observed that impulsive children made more errors in reading (1965) and on a variety of inductive reasoning tasks (1966). A substantial number of studies reviewed by Messer (1976) demonstrates differential performance by reflective and impulsive children on a wide range of cognitive tasks. Reflective children also perform better on Piagetian tasks such as conservation (Barstis & Ford, 1977). Strong relationship is also found between impulsivity-reflection and intelligence (Lawry, Welsh & Jeffrey, 1983). In Peters and Bernfeld's study (1983), impulsive and reflective children differ on social reasoning. While impulsive children attempt to escape social conflicts by quickly responding and yielding, reflective children tend to confront the problem and attempt to reach an adequate solution.

Our data show that personality traits and cognitive development are related (Table 15). Impulsivity-reflection has the highest correlation with cognitive development (0.41) while shyness has the lowest (0.28). The correlations of the other three traits range from 0.31 to 0.35. The data thus, indicate that the more reflective the person, the greater is the magnitude of cognitive development. The reverse is true with shyness, that is, the shier the child the lower the cognitive score.

III. Proposals for Facilitating Cognitive Development

One of the major research findings of the status of the cognitive development of preschool children is the pronounced differences in cognitive development between urban advantaged and estate children. One of the main sources responsible for producing the differential development is the educational and occupational status of the parents, especially the father's education (Chiam, 1991). In Malaysia, parents' educational and occupational levels are related because the occupational status is determined to a large extent by the level of education. It can, therefore, be concluded that education is fundamentally the hub of the child's development.

Table 15: Correlations Between Personality Traits and Cognitive Development

	Approach	Impulsive	Encourage	Shyness	Attentive
Cognition	0.35	0.41	0.38	- 0.28	0.31

All the correlations are significant at .001

Although numerous studies (such as Longstreth et al., 1981; and Yeates et al., 1983) have demonstrated that the child's intellectual development is related to his parents' IQ, especially his mother's, nonetheless, most of the correlations are less than 0.5. This implies that other factors also contribute to children's development. Bradley and Caldwell's study (1976) shows that emotional and verbal responsivity of mother, maternal involvement with child and provision of appropriate play materials have substantial association with the mental performance of children at 54 months of age. Crockenberg (1983) found that a mother's level of education, a responsive maternal attitude and smile and eye contact are predictive of a child's mental performance. These studies indicate that the home environment, especially the mother's attitudes towards child care, are important determinants of the child's cognitive development. It is not so much the parents' academic achievement but their knowledge of child care that will make the difference to the child's development. However, it cannot be denied that parents, especially mothers, who have a good education are more likely to have a better knowledge of child care than those without the benefit of education. One of the steps which can be taken to facilitate children's development is **to provide parental education and to equip young parents with parenting skills**. The provision for such an education is essential in view of the fact that the extended family system is becoming a thing of the past and there are little opportunities for on-the-job-training for parenthood. Furthermore, the increasing complexities of today's society necessitate the acquisition of parenting skills.

Our research findings suggest that the children's attainment of the five basic cognitive skills investigated is far from satisfactory. Classification which indicates the child's ability to identify critical attributes which are characteristic of a set of objects, is a cognitive skill basic to language development, particularly to vocabulary recognition and vocabulary verbalisation. Although more than 80% of the six-year-olds (except for the estate children) have mastered classification skill, less than half of the three-year-olds in the disadvantaged communities and slightly more than 50% of the three-year-olds in the urban advantaged have attained this mastery. This percentage is low as most children speak around two years of age and, by three, they should have a fairly large vocabulary. The acquisition of this skill can be facilitated by giving children arrays of objects to group. To make the task more interesting and to enhance thinking, the objects should be selected in such a way that they can be grouped in more than one way. This task can become an interesting game for the child.

To understand numbers, children need to understand that the lower number has less quantity than the higher one and the quantity remains the same if nothing is added or taken away. Therefore, the two basic cognitive skills necessary for understanding the number concept is seriation, which is the ordering of objects along some magnitude dimensions, and conservation, which is the invariance of the quantity, volume or weight if only transformation has occured. Children may be able to count up to even a hundred without mastering these two skills as rote counting is quite common. Children may even succeed in adding and substracting without acquiring these two cognitive skills. Such children have little or no understanding of the number concept and the operations done on them.

Seriation can easily be mastered. When young children stack up blocks or objects of different sizes they are likely to be ordering these objects according to intuition or perception (perceptual evidence). The ordering is not based on the concept of seriation but, when the child orders the objects by lining them, the child definitely demonstrates his understanding of seriation. Giving children objects of different sizes to pile up is the first step towards the acquisition of seriation because, from these experiences, children get insights into the concept of seriation.

Although our data show that very few preschool children have the cognitive structure necessary for the acquisition of conservation, nonetheless, experiences can be provided to give the experiences that will facilitate the attainment of this cognitive skill. There are many activities which involve the one-to-one correspondence concept which is basic to the understanding of conservation. Table setting, placing objects on outlines and hanging one's name tag on the allotted hook are some of the examples.

Decision-making is, in actuality, problem solving although not everyone examines the problem closely to find the best solution and not every decision is based on logics. Daily we have to make decisions. Since problem solving requires reasoning, these two cognitive skills are essential to effective living. Even young children are not spared from decision making. Mundane activities such as deciding whether to obey their parents or not involve decision making. Our finding that less than half of the total sample have mastered reasoning and problem solving suggests that most parents and caregivers pay little attention to the children's acquisition of these two skills. Even young children can reason, although intuitively at first, and solve problem. This can be demonstrated by placing a toy in the vicinity of a two-year-old and observing how he attempts to reach for it.

For children to acquire the skills of reasoning and problem solving, no elaborate equipment is needed although there are commercial games and programmes purported to stimulate children's ability to think. What is required of parents and caregivers is time for the child - time to listen to her, help her to make her decision and probe for the reasons for her decisions. For instance, when the child asks what colour she should use for colouring the cat, instead of giving her the answer which is very easy and time-saving, the parent or caregiver should ask what colour she thinks she should use or what colour she would like to use. The answer given should be followed by a request for explanations or should be probed to stimulate the child's thinking. Many of the children's questions can be turned around so that they have to think about the problem and give the answer.

There is a need to review the preschool programmes so that there is continuity and similarity in the philosophy of child rearing among the childminding centre, nursery and kindergarten. If there is repetition at these three levels, the child may be bored and unmotivated to forge ahead. On the other hand, if there are gaps and the child does not have the prerequisite skills to bridge them, then she may lose interest and/or self-confidence. Dissimilarity in philosophy and values will confuse the child.

Children have the innate curiosity and need to seek for mastery of their environment. They are eager to learn. Hence, parents and care providers should ensure that this need and curiosity are intensified and not quenched as they grow older. However, our observations reveal that the three- and four-year-olds are very spontaneous, resourceful, imaginative and creative. But, at five and six years old, they show less spontaneity, resourcefulness and creativity in their responses and by the time they reach the second grade in the primary school they do not seem to express much enthusiasm for learning. It appears that these traits in children wean slowly at first but gather momentum as they grow older. It is, therefore, necessary for preschool and primary school curriculum as well as for the childrearing practices to be scrutinised to arrest the loss of the joy for learning among children.

For the future of our children, we should be prepared to be open to suggestions and be humble enough to learn from each other and to cooperate with each other. The future of our children is in the hands of everyone of us.

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Appendix A

Distribution of Fathers by Occupational Level and Sector (In Percentage)

Occupational Class	UA	UD	RU	ES
	N = 587	677	1110	362
Class I	44.5	0.0	0.0	0.0
Class II	34.9	0.0	0.0	0.0
Class III	20.6	29.5	30.2	13.0
Class IV	0.0	68.5	68.1	86.5
Class V	0.0	1.9	1.7	0.6

Appendix B

Distribution of Mothers by Occupational Level and Sector (In Percentage)

Occupational Class	UA	UD	RU	ES
	N = 715	723	1226	383
Class I	10.3	0.0	0.0	0.0
Class II	15.8	0.0	0.0	0.0
Class III	20.7	11.9	10.2	2.6
Class IV	0.3	15.1	12.9	66.1
Class V	0.0	1.0	0.4	0.5
Class VI	46.6	72.1	76.5	30.8

Appendix C

Distribution of Fathers by Educational Level and Sector (In Percentage)

Educational Level	UA	UD	RU	ES
N =	578	671	1110	365
Did not go to school	0.0	3.7	4.1	14.0
Primary school	0.0	45.9	58.6	56.2
Form III	1.0	31.0	21.9	27.4
Form V	20.8	19.1	14.3	2.5
College	23.7	0.0	0.0	0.0
University	54.5	0.0	0.0	0.0
Religious school	0.0	0.3	1.1	0.0

Appendix D

Distribution of Mothers by Educational Level and Sector (In Percentage)

Educational Level	UA	UD	RU	ES
N =	580	681	1113	365
Did not go to school	0.0	7.2	12.4	23.3
Primary school	1.6	55.2	57.5	67.1
Form III	6.6	25.1	16.6	8.5
Form V	32.9	12.0	11.0	1.1
College	31.4	0.4	0.4	0.0
University	27.4	0.0	0.0	0.0
Religious school	0.4	0.0	2.1	0.0

Language Development – A Process of Children's Creative Construction

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Language is one of the most abstract and complex systems of rules a person will ever need to learn in his lifetime, yet a young child, whatever be his culture and his socioeconomic environment, will have learned to understand and use language in a remarkably short period. By the time he enters his first year of formal schooling, the child has acquired a well-developed system for relating meaning and expression in language. He acquires this language system through a continuous and active process of *creative construction* (Lindfors, 1987, p. 1). He uses language for cognitive as well as social purposes. He may even have control over more than one dialect or language system.

This paper is divided into two parts. In the first part, I will present, in summary form, the findings of the language development component of the Malaysian Child Development Study (MCDS) and discuss their significance.[1] A brief description of the language development measures is also given. For the second part of the paper, I will first give an overview of language development during the preschool years. The overview covers four prelinguistic development and aspects of language development - phonological, semantic, grammatical and pragmatic development. This serves as background to the next section and main thrust of my paper - to describe the cognitive strategies a child uses to acquire his language.

As teachers, we have often been advised to *start where the child is*. But, as Lindfors (1987) has pointed out, ". . . this advice is often interpreted as "Find out what's wrong with the child, so we'll know what to 'work on'".

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[1] For more details, please refer to "Language development" in H. K. Chiam (Ed.), *Child Development: Preschool Children*.

We would do better to interpret this advice as "Find out what the child has so we can use it to support her going beyond" (p. 66). If you accept this reinterpreted advice of Lindfors, then, hopefully, what I am going to discuss in this paper will help give you an idea on how to go about acting on that advice.

1. Language Development of Malaysian Preschool Children

In the MCDS, two aspects of language development were studied - vocabulary and fluency. The child's vocabulary was measured in terms of vocabulary recognition and vocabulary verbalisation. His language development is a composite of his vocabulary recognition, vocabulary verbalisation and language fluency scores.

The child was tested in the language or dialect he was most fluent in. More than one language or dialect could be used, depending on the child's needs.

The data obtained were analysed to ascertain whether the children in the study showed significant age, sectorial, ethnic and gender differences in their language development.

a) *Measures of Language Development*

The vocabulary recognition test follows the format of the Peabody Picture Vocabulary Test. However, the items are drastically changed to reflect our Malaysian society and to be representative of the sectors, ethnic groups and gender. The test consists of thirty vocabulary items or words that measured knowledge of objects, actions and occupations. Each item is depicted in the form of a picture and is accompanied by a set of three pictures as distractors. All the four pictures are on the same plate. For each plate the child is required to identify the object, action or occupation requested by the tester.

The vocabulary verbalisation test consists of 12 pictures of objects, actions and people. The child is shown each picture and asked to say what it depicts. His response is coded in terms of two levels: explanation or description (e.g. *small brother* instead of *baby*) and the correct term (e.g. *baby*). The first level (description) is given a score of 1 and a score of 2 is given for the correct term.

For the language fluency test, the child is shown three pictures and asked to select one picture that he wants to talk about. The tester records the child's response verbatim. The child's response is coded in terms of monolexical word, phrase, short sentence without elaboration or short sentence with elaboration. The scores range from 1 to 4 points with 1 point for monosyllabic word and 4 points for short sentence with elaboration.

b) Summary of The Findings

The children's language development shows a clear developmental trend. Older children score higher than younger children on all four measures of language development that is vocabulary recognition, language fluency and language development which is a composite of the three component scores. However, no clear pattern in the increment is observed. In the urban advantaged sector, vocabulary recognition scores show a jump between ages 3 and 4. However, in the urban disadvantaged and rural sectors, the jump occurs between ages 4 and 5. A more gradual increment is observed in the estate sector.

In terms of sectorial differences, urban advantaged children tend to obtain the highest scores while the estate children score the lowest on the two measures of vocabulary development. However, the estate children perform at par or even better than the children from the other sectors for language fluency.

In terms of ethnic differences, all three ethnic groups in the urban advantaged sector show little difference in their performance on all the language development measures. In the urban disadvantaged and rural sectors, significant ethnic differences are observed but these differences are not consistent throughout the four age levels.

No significant gender differences are observed in any of the language development variables.

It is not surprising that developmental trends in the children's language development are observed in the MCDS. The study covers *normal* children within the age range of 3 to 6 years, a period well-documented for rapid language development. In Singapore, Ko and Thomas (1986) have found the trend to be developmental for preschool children's general language development in both English and local languages.

The MCDS finds that urban advantaged children perform better on most of the language development variables. This seems to imply that the socioeconomic factor plays an important role in the children's language development. However, this factor has been considered the most controversial of all the dimensions of variation in child language. Wells (1986) has indicated that points of disagreement have been in terms of the nature and size of variation, whether the major differences between groups are in the resources available or in the uses made of these resources, the parameters that should be used to distinguish significant social groupings and the mechanisms responsible for the relationship between social group membership and linguistic variation. Labov (1972) has indicated that the conditions under which speech samples are collected may also have affected children from different social classes differentially. A combination of some or all of these factors is more likely to give a clearer picture of the child's linguistic environment than any one factor considered singly. In the MCDS no definitive statement about the sectorial variation observed in the children's language development can be made pending further investigation.

In the MCDS, significant ethnic differences are observed in the urban disadvantaged and rural-estate sectors for performance on the language development measures. This seems to imply differences in cultural practices and attitudes towards child language acquisition held by the three ethnic groups. However, such differences seem to fade in importance when the ethnic groups' socioeconomic status improves as no significant ethnic differences are found in the urban advantaged sector. It is difficult to relate the study's findings on ethnic differences to studies in the West as the latter tends to investigate the acquisition of standard English by Blacks and other minority groups. The question of non-standardisation or dialect does not come into the MCDS as the children have been tested in the language or dialect that they are most proficient in.

A review of literature by McCarthy in 1954 shows evidence of the superiority of girls with respect to many aspects of language development. However, more recent reviews by Cherry (1975) and Macaulay (1978) indicate that what differences there are between the sexes are in rate rather than in style of acquisition but they are rarely significant and do not consistently favour either sex. The MCDS gives further support to this view as no significant gender differences have been found in the children's language development.

2. Preschool Language Development - An Overview

In the normal course of events, all children whether they are bright or dull, pampered or neglected, from rich or poor homes, acquire the language or languages they are exposed to as they are growing up. All of them follow a predictable, general course in their language development though at varying degrees of speed. What is this general pattern of language development? The second part of this paper gives an overview of language development of the preschool child - the focus of this Conference.

a) Prelinguistic Development

As parents, we tend to think our child's first word which appears usually between the first and second year of life, as marking the beginning of his language development. But infancy research indicates that communication development starts from birth and that infants are especially prepared for language development. Evidence of this is the presence at birth of structures that are well-adapted for language use later. For example, smiling "uniquely adapted to affect other persons" (Trevarthen, 1977, p. 233), and hand movements are all present from birth to be used for language later. In the first few months of life, infants show certain behaviours that are precursors to later language skills. They prefer human faces to objects. They indicate their ability at turn-taking in mother-child interaction by using physical movements and vocalisations. They develop an understanding of self and other as distinct entities. All these behaviours indicate that the basis for language development has already been set long before the first word is heard.

b) The Preschool Years

Language can be viewed as having four components - phonology, semantics, grammar and pragmatics. Let us look at each component separately although in reality the four components are interdependent in their development.

(i) Phonological Development

Phonology concerns how we understand and produce the speech sounds of language. The process of acquiring accurate pronunciation skills is a complicated one; it depends on children's increasing control over their articulatory apparatus, improved ability to attend to complex phonological sequences and growing capacity to monitor and revise their own faulty productions so that they match adult speech. By the time children reach four years of age they have made considerable progress at this task. Phonological development is almost complete by the time they are ready for school; a few complex accent patterns are not mastered until late childhood and adolescence.

(ii) Semantic Development

Semantic development involves identifying the underlying concepts expressed in words and word combinations. During the preschool years, children build up a large vocabulary with extraordinary speed by engaging in fast mapping, a cognitive process whereby they are able to connect a new word with an underlying concept after only a brief encounter. The influence of cognitive development on vocabulary growth is seen in the order of children's word acquisition. Early vocabulary consists mainly of object words followed by action and state words. As they are learning new words, children make errors such as overextensions (for example, using the word *dog* for all four-legged animals), underextensions (for example, using the word *doll* to only denote a particular doll) and mismatches, applying new labels to an inappropriate set of events (for example, using *old* to mean *something I want* and *new* to mean *something I don't want*). Young children also like to coin new words, for example, *crayoner* for person using crayons. Overextensions as well as word coinage are communicative devices that help children stretch their limited vocabulary to the utmost. Research indicates that adult feedback on children's inaccurate use of word helps the process of semantic development. However, the children's own active cognitive processing plays a major role. Children look for consistencies in adult's usage of words; they try out words based on initial hypotheses about their meanings and then make adjustments based on additional adult usage and feedback from others. As preschoolers enlarge and refine their vocabulary, errors of mismatch, overextensions and underextensions gradually disappear.

(iii) Grammatical Development

Grammatical knowledge involves two aspects: *syntax,* the rules by which words are arranged into comprehensible sentences, and *morphology,* the application of grammatical markers that denote number, tense, person, gender, as well as other meanings in the language. Research shows that children are active, rule-oriented learners who acquire basic grammatical categories of their language during the early preschool years and master a wide variety of complex grammatical constructions by the time they enter school.

Generally, grammatical development is divided into two phases based on mean length of utterance (MLU). In the first phase, the one-word utterance, infants, with the help of gestures and intonations, use single words to express meaning that seem sentence-like in nature. For example, the child's utterance of *ball* combined with the gesture of pointing at the object and looking at his mother, might mean *Get me the ball.* However, there is no definite evidence that their one-word utterances are really holophrases (one-word sentences).

During the next phrase, the two-word utterance, at about 1½ to 2½ years of age, children combine two words together, for example, *mommy shoe* to express many meanings. Smaller and less important words like *the, in, a* are omitted. These telegraphic utterances as they have been called do not seem to follow adultlike grammatical rules.

Between the ages of 2 and 3, children enter the simple sentence stage (MLU moves from 2 to 3) where word order conventions of the children's linguistic community are followed. They also acquire grammatical morphemes in a consistent order that reflects their structural and semantic complexity. For example, the *what, where* and *who* questions appear earlier than the *how, why* and *when* questions. Between 3 to 6 years of age, and as the MLU advances from 3 to 4 and beyond, children acquire increasingly complex grammatical forms such as conjuctions connecting whole sentences and passive sentence forms. By the time they are ready for school, they have mastered an impressive variety of grammatical constructions. Current theories believe that powerful cognitive processing mechanisms help young children discover the regularities of grammar. (These mechanisms will be discussed later in this paper). Although parents do not deliberatly correct children's grammatical errors, the simple syntactic structure of motherese (the altered language adopted by adults when speaking to young children and characterised by simple sentences, exaggerated intonation and very clear pronunciation) and adult expansions of children's utterances facilitate grammatical development.

(iv) Pragmatic Development

This involves the communicative aspect of language. It deals with the ability to engage in linguistic discourse with others - how to take turns, maintain topic relevance, communicate clearly, accurately gauge a speaker's intended meaning by noting the use of gestures, tone of voice and context in which the verbal message occurs. The beginnings of these abilities are established in the infancy stage. During the preschool years, children become more effective conversationalists. They are able to participate in sustained discourse. They are able to maintain a single topic of conversation over a greater number of turns. They are also able to appreciate illocutionary intent (what a speaker means to say, even though the linguistic form of the utterance is not consistent with it, for example, *I need a pencil* can be giving information or a directive to do something depending on the context in which it is said). The ability to send unambiguous messages and to recognise when a message received is unclear also develops during the preschool years. Preschool children are also able to adjust their speech acts to differentials in age, sex and social status. Finally, their sensitivity to social expectations conveyed through language which appears early undergoes further refinement during the preschool years. This is achieved through direct observation as well as through the concerted efforts of parents to teach the social forms that would make their children acceptable speakers in the society.

3. Young Children's Language Acquisition Strategies

Young children acquire language naturally without any formal instruction. In the normal home, parents do not give explicit instruction in language nor do they plan a sequenced curriculum for their language-learning child. They do not give or withhold reinforcement on the basis of the child speaking grammatically correct sentences but on the truthfulness of the message. So how do young children *crack* the complex code of language which linguists have spent years and are still struggling to unravel its complexities?

Researchers, systematically studying child language acquisition in natural settings, have been able to identify and describe certain cognitive strategies that children seem to be using as they figure out how language works. These researchers observe that when children are interacting in meaningful contexts, they do not simply imbibe or absorb the language they hear around them; rather they attend to it selectively and use it as *data* to make sense of the world around them. What are these ways of making sense? Lindfors (1987) describes them as follows:-

a) Use your nonlinguistic understanding as a basis for figuring out language

The young child seems to make the basic assumption that what he hears or sees in print in a particular situation refers to that situation. This assumption often works for him, especially in mother-child interactions. As he builds up an understanding of his world through his senses, he translates this understanding into language. He uses what he knows to figure out what he does not know.

b) Use whatever is salient and interesting to you

Young children do not attend to all aspects of language that they hear. They select and focus on particular aspects only. For example, many young children's first words refer to objects they can act on and to objects that move and change. Perceptual characteristics such as shape, size, sound and taste may also be the focus of attention. A child's focus of attention is different at different periods of his development and his focus of attention may not be the same as another child's. By attending selectively and focusing attention, the young child builds up his language system.

c) Assume that language is (mainly) used either 'referentially' or 'expressively' and use language data accordingly

Research shows that young children seem to *tune in* to language in two different ways: *referential* and *expressive* as identified by Nelson (1973). According to him, referential children seemed to see the primary function of language as naming objects while expressive children saw language as serving social-affective function. Thus, the referential children's early vocabulary consists mainly of object names while social expressions abound in the expressive children's early vocabulary. However, it is not necessary that one style is used by a group of children all the time; some children adopt both styles and use each style in particular contexts; what is important to note here is that as with the previous two strategies mentioned, young children, in using this strategy, make certain assumptions about language and then proceed to act on them.

d) Produce language and see how others respond

When a child uses this production strategy, typically, he gets response from others in the form of talk. This provides him with more language *data* to work on. In some societies as in the West, this strategy may be especially valued as an informal *measure* of a child's language development.

e) Observe how others express meanings

A child using this comprehension strategy, is normally seen as talking less and observing more: attending selectively, tuning in, watching how meaning and verbal expressions relate (Nelson, 1973). In a society where the production strategy mentioned earlier is highly valued, this comprehension strategy may be regarded as passive. But research has indicated that neither one strategy is more advantageous than the other. Both strategies have been found to correlate with high linguistic maturity at age 2 (Nelson, 1973).

f) Ask questions to elicit the data you want

Many children are observed using this questioning strategy during the period of rapid vocabulary expansion at around ages 2 and 3. Questioning is an effective way of learning about the world. Nelson (1973) found questioning at age 2 to relate positively with vocabulary acquisition.

g) Imitate what other people say

In observing children using this strategy, researchers are faced with two main problems. One problem is defining imitation. Many types of imitation have been studied - spontaneous, elicited, immediate, delayed, imitation with expansion, reduced imitation. Consequently, it is very difficult to compare the results of such studies as different definitions have led to different bodies of data to be examined. The other problem is to consider whether imitation is progressive, that is, whether it advances a child's linguistic development. Some studies indicate that children only imitate constructions of the types they already have control. If so, imitation does not advance the child's linguistic system. However, in other studies, children's imitations are considered to be more complex than the nonimitated utterances, thus imitation is considered progressive. Some researchers are viewing the process of imitation as an active, selective, child-determined process rather than just "echoism: the fact that children echo what is said to them" (Jespersen, 1922, quoted in Bloom, Hood and Lightbown 1974, p. 381). Bloom, Hood and Lightbown, (1974) observed that children imitated only words and structures in the speech that they heard which they appeared to be in the process of learning (p. 416). In Keenan's study (1977), he found imitation being "used by the young child to participate actively in conversation at a time when his syntactic development is minimal".

h) Use some general "operating principles" to figure out language

Slobin (1973) intensively studied cross-cultural data on first language acquisition and observed a number of commonalities in the way children learn widely diverse languages. Based on these, he posited a number of operating principles "which the child brings to bear on the task of organising and storing language" (Slobin, 1973, p. 191). Some of these operating principles are stated as follows:

(i) Pay attention to the ends of words

To attend to word endings is one of the earliest strategies used by young children. As such, children find it easier to acquire suffixes than prefixes. Thus in the English language, the suffix plural -s (cats), the present progressive -ing (pushing) and the past -ed (pushed) are learned earlier than the prefixes un- (unhappy) or im- (impossible). However, the importance of the nonlinguistic context cannot be minimized. Children will attend to the ends of words only if they are expressed in meaningful situation. For example, tree and trees are uttered in basically the same nonlinguistic context unlike pat and patches, though sounding alike, would not be confused that the latter pair of words (pat and patches) are variants of the same word.

(ii) Pay attention to the order of words and morphemes

Children, whatever language they are learning, typically preserve the order of the input language. By attending to word order, children are provided with clues for identifying the grammatical relationship of a sentence, such as its subject, predicate and object. So powerful is the word-order strategy that preschool children misintepret reversible passive sentences such as *The boy was pushed by the girl,* to mean *The boy pushed the girl.*

(iii) Avoid exceptions

The search for regularity and predictability of linguistic form aids children in their mastery of syntax. Rules internalised by children are applied in a consistent fashion over many months or even years. Thus, for example, three-year-olds would overregularise the regular *-ed* form of the past tense by saying *breaked, runned, eated* and so on. The realisation, that exceptions to the rules are not only permitted but are necessary, comes with linguistic maturity.

(iv) Avoid interruptions or rearrangement of linguistic units.

When young children begin to produce Wh-questions (questions that begin with *how, who, what, where, when* and *why*) they tend not to rearrange the linguistic units to produce a grammatically correct question form.

Thus, they would say, for example, "Mommy, where Daddy is going?" or "What he is eating?". They simply attach a *Wh-* element to a basic sentence type in order not to interrupt the linguistic units. Preschoolers also avoid interrupting the main thrust of a sentence to include additional information. For example, when asked to imitate a complex sentence "The boy who fell down cried" they would say "The boy cried" leaving out the relative clause (who fell down). Older children understand that switching word order as well as interrupting linguistic units is necessary to produce grammatically correct Wh-questions and complex sentences.

The operating principles (there are more; I have only mentioned four here) outlined by Slobin are early processing strategies that children use to discover the structure of language. "They seem especially geared to noticing certain aspects of the input language data (order of parts, general patterns) and to utilizing it in building their language systems" (Lindfors, 1987, p. 192).

(v) "Make the most of what you're got" (Fillmore, 1976, p. 649)

It seems amazing how young children manage to do so much with so little. They say "doggie" to mean "dogs and sheep" (Clark, 1983, p. 822) or "cup glass" to mean "I see a cup and glass" (Slobin, 1971, p. 46). They use this semantic and syntactic stretching to fill in gaps of knowledge about the language. Besides this, they also stretch their language to enhance their participation in conversations by repeating what others say to them by way of establishing a conversational topic. Thus, the *making-the-most-of-what-you've-got* strategy is used by language-learning children not only to fill in linguistic gaps but also social ones.

In considering these language acquisition strategies, Lindfors asks us to note the following important points:

1. The identified strategies cut across components of language, that is, a child might use a particular strategy to work out his understanding of the semantic as well as the syntactic aspects of his language.

2. A particular strategy is not used by all children nor is it preferred by one child all the time. Each child typically uses a variety of strategies, some more at earlier periods of development and others more at later periods.

3. The strategies identified are by no means a comprehensive set, that is to say, research has not accounted for all the abilities children have shown or are showing in learning a language. ". . . children's abilities to learn language far outrun researchers' abilities to understand how they do it" (Lindfors, 1987, p. 176).

As parents and teachers, have we observe some, if not all, of these strategies being used by our children? If so, how have we taken these strategies into account as we organise activities for our children's language development? What role should we play to enhance our children's language development? Perhaps these questions can be discussed at the workshop sessions of this Conference.

A word of caution before I conclude. In our efforts to enhance our children's development, be it language, cognitive, physical, social or emotional development, we must be ever careful that we do not become overconcerned or overinvolved in our efforts. I have just read a very useful and thought-provoking book called, *The Too Precious Child - The perils of being a superparent and how to avoid them* by Lynne H. Williams, Henry S. Berman and Louisa Rose. I would like to quote the words written on the book's dustjacket, "Ask yourself: Could I be an overinvolved parent?"

> We upwardly mobile Americans want it all; we strive for fulfilling careers, yet we yearn to create close families. Harmonizing career and family in our overachieving society seems at times to be an impossible task. To add to the difficulty, some of us have fallen into the trap of trying to do it all perfectly. Our peers as well as the experts on child development have played a part in this scenario, filling us with exhortations and warnings. See that your newborns receive enough intellectual stimulation. Push early learning. Be available for the "right" kind of attention. But out of our best impulses, could we also be hurting the child who is not free to be simply average, to follow his or her own bent, who is not free to be fully a child, and later not really free to be an adult either?

The message is meant for parents but, I believe it can also be applied to overconcerned teachers. The message is given in the context of the American society. But, I believe the message is applicable to our Malaysian society as we see a growing number of parents and adults overinvolved in the lives of our young children. Lately, our society is showing great concern for children who are abused by adults through neglect and physical and sexual torture. Are we not abusing our children if we are overprotective and overconcerned to the extent that we deprive them of being fully a child? As we move toward Vision 2020, let us not force any child to be a future Einstein or Mozart.

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Socio-emotional Development of Preschool Children*

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1. Introduction

In recent years, the socioemotional development of preschool children has progressively assumed a prominent role in studies on developmental trends in children (Masters & Furman, 1981). Psychologists have become increasingly aware that the socioemotional development of children has a tremendously important impact on the overall development of the child. The child of today becomes the adult of tomorrow. Significant progress has been made in recent years in the study of human development in terms of the child's socio-emotional development. However, empirical research on socioemotional development is still limited, especially in Asian countries like Malaysia.

In the Malaysian Child Development Project, socioemotional development encompasses the development of prosocial behaviour as well as the development of basic emotions such as happiness, sadness, anger and fear. This paper focuses on the developmental trend of sharing behaviour, social interaction, racial awareness, development of basic emotions and the ability to empathise.

2. Subjects

The subjects consist of 3099 children aged three to six years old from the Federal Territory of Kuala Lumpur and the neighbouring state of Selangor. Of this number, 717 are from the urban advantaged (UA) sector, 737 from the urban disadvantaged (UD), 1240 from the rural (RU) sector and 411 from the estate (ES) sector. When analysed according to ethnic grouping, 36% of them were Malays, 38% Chinese and 26% Indians. The urban advantaged children come from a much more favourable environment than their counterparts from the other sectors. Almost half of their fathers are in the professional class whereas none of the children in the other three sectors are in this category. Furthermore, both of their parents received much more education than parents of the other sectors.

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* This paper is based on the data of the Malaysian Child Development Project

3. Social Development

In the Malaysian Child Development Project, social development comprises prosocial behaviour and racial awareness. Prosocial behaviour is seen as the sharing behaviour of the child as well as his ability in social interaction.

3.1 Sharing behaviour

Developmental theorists (such as Krebs, 1970) have suggested that the move from the purely hedonistic behaviour of the young child toward the more altruistic behaviour of an older child is central to the goal of early socialisation. According to Hull and Reuter (1977), an altruistic response can be defined as "one which benefits a recipient but results in at least no gain and sometimes a loss to the donor" (p. 147). Green and Schneider (1974) have suggested that altruism may not be unidimensional across tasks. Generally, sharing behaviour is chosen, as in this paper, as a measurable dimension of altruism. As urged by many educationists, such as Marantz (1988), research efforts in the area of socializing prosocial behaviour, such as sharing behaviour, must focus to a greater extent on the child under seven years of age. The developmental trend for sharing behaviour has some empirical support in studies such as those by Krebs (1970) and Byran (1972).

To obtain a measure of the child's sharing behaviour, the child was presented with a plate containing five pieces of wafer and another plate containing five pieces of chocolates for the child to choose the food items he/she preferred. The chocolate or wafer selected by the child is then distributed between the child and the tester until only one piece was left. The child was then asked what he/she would do with the remaining piece of wafer/chocolate. The child's response was classified into *I take it*, *you take it* or *we share/give it to others.*

A developmental trend in sharing behaviour is discernible in the subjects. The older the child is, the more likely he is to exhibit sharing behaviour. The younger children tend to be more self-centred and are more likely to say *I take it*. The percentages of the three- and four-year-olds who want to keep the wafer/chocolate are 53.0% and 41.3% respectively while percentages of the five- and six-year-olds who prefer to share the item are 44.1% and 45.6% respectively.

Table 1: Sharing Behaviour by Age and Sector (In Percentage)

Age (Yrs)		All	UA (647)	UD (648)	RU (1087)	ES (317)
3	I Take It	53.0	54.1	53.3	49.8	58.1
	You Take It	16.5	16.7	16.8	15.7	17.4
	We Share	30.5	29.2	29.9	34.6	24.4
4	I Take It	41.3	34.4	40.1	44.5	47.8
	You Take It	25.7	32.3	24.2	23.9	20.4
	We Share	33.0	33.3	35.7	31.6	31.9
5	I Take It	25.0	25.9	27.3	22.7	28.4
	You Take It	44.1	51.8	39.0	44.4	39.8
	We Share	30.9	22.3	33.7	32.9	31.8
6	I Take It	23.0	18.4	16.0	27.5	33.3
	You Take It	45.6	59.2	36.1	47.3	26.7
	We Share	31.3	22.4	47.9	25.2	40.0

There are no significant differences in sharing behaviour among the UA, UD, RU and ES children, except for the six-year-olds in the estate sector. A significantly higher percentage of the six-year-olds in this sector are willing to share. However, in this group, the percentage of those who said *I take it* is also significantly higher than their agemates in the other sectors. The percentage who said *You take it* is hence smaller than the other groups.

3.2 Social Interaction

It is highly probable that sociability is beneficial to a child's intellectual and emotional development. It is hypothesised that children can learn a great deal through social interactions, not only through adults but also through other children. The greater the number of people the child can interact with, the greater is his/her sphere of experience. Social interactions also profit the child emotionally. The ability to interact with others will give the child the feelings of self-worth and acceptance. Sociable children are more likely to be emotionally more stable and more confident.

The best method to measure this variable is to observe how the child reacts to other children and adults. In view of the fact of the large number of

Table 2: Social Interaction by Age and Sector (In Means)

Age (Yrs)	All	UA	UD	RU	ES
3	8.24	9.05	8.13	7.99	7.78
4	8.45	9.23	8.35	8.45	7.73
5	8.52	9.54	8.26	8.53	7.66
6	8.79	9.37	8.67	8.68	8.55

children we are studying, such a method is impractical. We have, therefore, to rely on parents' reports. Parents were interviewed to obtain their observations on the child's reactions to strangers, the type of children the child prefers to play with (in terms of age) and the behaviour of the child in a play situation. A 5-point Likert-type scale was used to rate the child's behaviour in each of these situations. The total score measures the sociability of the child.

The analysis of the social interaction scores according to age and sector shows that, for the total sample, significant differences in social interaction scores are observed in the four age groups, with the younger children having lower scores (Table 2). Developmental trends are clearly discernible in the urban disadvantaged, rural and estate sectors. In the case of the urban advantaged sector, younger children are also socially less able than the older ones, except for the six-year-olds who have lower scores than the five-year-olds.

When the social interaction of each age group is analysed by sector, the urban advantaged children who are aged three, four and five years are apparently superior in social interaction compared to their agemates in the other three sectors. Furthermore, the four- and five-year-olds from the rural sector have significantly higher social interaction scores compared to the estate and urban disadvantaged children. By age six, sectorial differences in the social interaction are no longer significant.

3.3 *Racial Awareness*

Malaysia, being a cosmopolitan country with a citizenry originating from diverse racial backgrounds, faces an urgent goal of instilling national unity among its people. Knowledge about children's racial awareness or the lack of it, would be invaluable to any national strategy devised to assist in the

Table 3: Racial Awareness by Age and Sector (In Percentage)

Age (Yrs)		All	UA (647)	UD (694)	RU (1139)	ES (368)
3	Racially Aware	2.0	1.5	2.3	3.1	0.0
	Unaware	98.0	98.5	97.7	96.9	100.0
4	Racially Aware	4.8	5.3	1.2	9.8	0.0
	Unaware	95.2	94.7	98.8	90.2	100.0
5	Racially Aware	8.0	7.2	7.3	11.1	1.4
	Unaware	92.0	92.8	92.7	88.9	98.6
6	Racially Aware	13.2	10.7	13.1	14.3	14.3
	Unaware	86.8	89.3	86.9	85.7	85.7

integration of the various races. Presently, racial polarization is one of the main festers, if not the fester of the nation's disharmony. Understandably, the Government is very concerned about the disharmony between the three main ethnic groups and has set up the National Unity Board to eradicate feelings of racial discordance. However, instead of diminishing, racial polarization has escalated. Therefore, it is exigent to investigate whether young children are aware of their ethnicity and are racially polarized in that they display ethnic preference in choosing their playmates. However, very little research has been carried out on racial awareness among the children and most of the data are from the West, particularly the United States of America. The literature available (for example, Clark & Clark, 1969; Horowitz, 1939; Ballard & Keller, 1976) have suggested that the results obtained are very much dependent on task and situational differences.

Racial awareness in this study is measured in terms of the child's preference for playmates of his/her own race. Pictures of Malay, Chinese and Indian boys or girls were presented to the child to select the one with whom he/she would like to play with. The photographs presented to the subject were of the same sex as the subject.

The results for racial awareness show that, in all cases, less than 20% of the children demonstrate racial awareness (Table 3). In spite of the small number of racially aware children, the developmental trend is clearly visible in all the sectors as well as in the total sample. The trend is towards increasing racial awareness as the children grow older.

In the total sample, a big increase in the percentage of children who are racially aware is found between five- (8.0%) and six-year-olds (13.2%). Only 2.0% of the three-year-olds and 4.8% of the four-year-olds manifest racial awareness respectively.

3.4 Emotional Development

Bridges' (1932) work on emotional development of children, particularly during the first two years of human life, has laid the fundamental groundwork leading to the present understanding of the origin and development of emotions. She made extensive observations of newborn infants and nursery-school children. According to her, a child is born capable of experiencing and expressing only undifferentiated excitement, which by the age of three months or so, becomes differentiated into the positive and negative, namely, delight and distress. She suggested that relaxation, smiling and cooing are indications of delight accompanying satisfying situations whereas crying and muscular tensions are indications of the distress accompanying unpleasant situations. By the age of six months, distress has become differentiated into anger, disgust and fear while delight is differentiated into elation and affection by the age of one year. The child demonstrates increasing differentiation until the age of two years, when most of the complex adult emotions are manifested.

Presently, psychologists believe that emotion, which constitutes a stirred-up state of the person, has mental, motive and physical components. Emotion is considered to have a mental component since it is a conscious experience and involves feelings such as happiness, sadness, anger and fear. It also has a physical component since it embraces a vast complex of physiological changes, including muscular, chemical, glandular and neural activities. In addition, emotion has a motive component since it involves a continuous readaptations to the problems inherent in an ever-changing environment. Considerable research efforts have been directed toward a better understanding of the nature and development of emotions, particularly in adolescents. However, there remains many challenging areas which need basic research. One of these areas involves research into the development of basic emotions such as happiness, sadness, anger and fear in children.

Two aspects of emotional development are investigated in this paper. They are development of basic emotions and children's ability to empathise. A modified version of Helene Borke's method was used to assess development of emotions and ability to empathise. To measure development of emotion, children were shown four pictures portraying a sad child, a happy child, an angry child and a frightened child and they were required to identify each one of the emotions by selecting the picture which shows a sad, happy, angry or frightened child. Two levels of analyses were carried out. First, the results present the percentage of correct recognition of the four emotions.

Table 4: Recognition of Basic Emotions by Age and Sector (In Means)

Age (Yrs)	All	UA	UD	RU	ES
3	1.71	2.06	1.72	1.50	1.43
4	2.11	2.67	2.08	2.02	1.50
5	2.66	3.29	2.73	2.49	2.21
6	2.99	3.47	3.06	2.77	2.86

Secondly, a correct response is assigned one point, thus giving each respondent a maximum of four points.

The results for the recognition of emotions show that, for the sample as a whole, there are more children able to recognise the portrayal of happiness and sadness than that of fright or anger. About 66.4% of the children can recognise the picture of a happy child and 61.9% of them can recognise sadness, while only 49.8% of the children can recognise the frightened child and 54.2% of them can recognise anger.

When the results are analysed by age, there is a general developmental trend of recognition of the emotions. The percentage of children who correctly recognise each of the four emotions shows a definite increase from three- to six-years-olds. The results also show that, for anger and fear, less than 40% of the three-year-olds can recognise these emotions. However, for happiness and sadness, 53.5% and 46.6% of the three-years-old successfully recognise these two emotions respectively. By the age of six, the recognition of the four emotions have increased significantly; the percentages have increased to 82.1% for happiness, 77.8% for sadness, 72.1% for anger and 67.2% for fear.

When the recognition of basic emotions is analysed for sectorial difference, the results show that there is a discernible pattern in the children's ability to recognise each of the four emotions among the four sectors. The pattern is the same for all four emotions and is in the descending order of:

urban advantaged sector > urban disadvantaged sector > rural sector > estate sector

The data are next analysed by taking the sum of the correctly identified emotions; one point was assigned to each correctly recognised emotion, thus giving each child a maximum of four points. The results of this analysis show clearly discernible developmental trends in the development of the basic emotions in the total sample in all the sectors. The younger children seem less able to identify the different basic emotions. The differences between the four age groups reach the .05 level of significance. The Scheffe Multiple Comparison Test reveals that, in the total sample, the three-year-olds are significantly less able in recognition of basic emotions than the four-, five- and six-year-olds and the four-year-olds also have significantly lower ability than the five- and six-year-olds. No significant differences are found between the five- and six-year-olds.

When the development of basic emotions is compared across the sectors for each age group, the urban advantaged children score the highest for this task while the estate children have the least ability.

The differences between the sectors at each age level was subjected to statistical testing using the Scheffe Test. The results show that at age three, four and five, the urban advantaged children are emotionally more developed than the children from all the other three sectors. At age six, however, the urban advantaged children are only significantly more emotionally developed when compared to the rural children. It seems that the earlier differences in emotional development between the urban advantaged children and the children from the estate and urban disadvantaged children are no longer discernible at age six. One possible reason for the levelling off in the emotional development could be attributed to the kindergarten experience gained by the six-year-old children in the urban disadvantaged and estate children. Unlike the rural children, most children from the urban disadvantaged sector are able to attend only one year of preschool - the year before going to primary school.

3.5 Empathy

Empathy is an important human capability that is believed by social psychologists (Eisenberg & Strayer, 1987) to play an important role in the psychological development of the individual. The concept of empathy has been given various meanings in the literature of social psychology. Some researchers (Borke, 1971) have defined empathy as the cognitive ability to recognise and understand the thoughts, perspectives, and feelings of another individual. Another widely accepted view by some other researchers (Hoffman, 1982) and the one adopted in this paper, conceive empathy as a vicarious emotional experience of a perceiver to the emotional experience of a perceived object. This vicarious emotional reaction may occur as a response to overt perceptible cues indicative of another person's emotional state or as a consequence of inferring another's state based on indirect cues. In this paper then, empathy is defined as an emotional response that arises from another person's emotional state.

The question of how empathy develops has been addressed by numerous theorists and researchers such as Thompson (cited in Eisenberg & Strayer, 1987, p. 119). Generally, these theorists offer different hypotheses regarding the origin and development of empathy, ranging from biological-genetic factors through early conditioning and observational learning to socio-cognitive development, particularly of imaginative skills and affective role taking. However, as pointed by Eisenberg and Strayer (1987), regarding age-related development in empathy, "there are serious gaps in our knowledge, notably in the design of suitable instruments and measures for use across the life span, and in our understanding of the relations among different kinds of measurement methods" (p. 396).

Nevertheless, there is consensus among researchers that the development of empathy in children has important consequences for the total development of the child. In particular, empathy has been found to relate positively to prosocial behaviour and is perceived as a motivator of prosocial behaviour. Empathy development is also considered by some researchers (Eisenberg & Strayer, 1987) as important to the personality development of the child.

Gender differences in empathy have been rather widely investigated as peripheral issues in related studies, mostly motivated by the desire to test the view that females are more empathic than males. Sociologists have generally attributed differences in the behaviour of males and females to differences in the traditional sex-roles of males and females. There are some empirical data that tangently support the notion that girls are more empathic than boys (Greif, Alvarez & Ulman, 1981). However, data directly addressed to the issue of gender differences in empathy is still inconclusive.

The topic of age trend in empathy has not received much attention from researchers. Apart from the research conducted by some investigators (Adams, 1983; Radke-Yarrow & Zahn-Waxler, 1984) based only on cohorts from a narrow age span, there is generally a dearth of research literature on age trend in empathy. One of the purposes of the Malaysian Child Development Project is to explore gender and age differences of preschool children in their ability to empathise.

The projective method was used to investigate young children's ability to empathise. The children were told four stories, each of which depicted one of the four basic emotions (happiness, sadness, anger and fright) and they were asked to identify the feelings of the child involved in each of the stories. One of the stories described the death of a pet rabbit (sadness), the second recounted how a child kicked the construction which his sister and her friend had built (anger), the third narrated a thunderstorm (fear) and the fourth related the coming home of the mother (happiness). The child was asked to identify the feelings of the child involved in the story. Two levels of analyses

Table 5: Empathy by Age and Sector (In Means)

Age (Yrs)	All *	UA	UD	RU	ES
3	1.08	1.26	1.13	0.89	1.07
4	1.75	2.26	1.57	1.64	1.45
5	2.48	2.84	2.64	2.32	2.28
6	2.81	3.04	3.14	2.61	2.43

are performed. Firstly, the percentage of the children who are able to recognise the emotion in each of the stories is computed. Secondly, a total empathy score is computed based on the number of correct identification of the emotions in the four stories. The mean of this score is then computed for each child.

The children's ability to display empathy for anger, sadness, fright and happiness are 42.0%, 49.4%, 53.0% and 53.7% respectively, implying that it is easier to empathise with a happy and angry child than with a sad or frightened child.

When the results were analysed by age, there is a general developmental trend in the ability to empathise. The percentage of children capable of empathy shows a definite increase from three to six years. The results indicate that the percentage of children who are able to empathise with a sad, fearful and happy child increases from about 25% to 75%. However, the number of children who can empathise with an angry child does not increase much across the four age groups. The percentages are 25.9% for age three, 37.6% for age four, 52.8% for age five and 54.2% for age six. It seems that Malaysian children can empathise with feelings of happiness, sadness and fear more easily than anger.

When the sum for the empathy score for the four emotions is analysed for each sector by age, the results show that there is a discernible pattern in ability to recognise happiness, sadness and fear. The pattern is the same for all the three emotions and is in the descending order of:

UA > UD > RU > ES

Fewer of the urban advantaged five- and six-years-olds are able to empathise with an angry child compared to children from the other sectors.

When the score for ability to empathise is summed up for the four emotions, a developmental trend is also discernible. This trend is observed in the total sample as well as in the four sectors.

Analysis of the data for each age group across the sectors indicates that, from age four to six years, the children from the urban advantaged sector manifest significantly greater ability to empathise than their rural and estate agemates. At age five and six years, the urban disadvantaged children also exhibit significantly greater empathy behaviour than the estate and rural children.

Discussion

The present paper attempts to obtain a profile of the social and emotional development of a group of Malaysian preschool children. Two aspects of social development are investigated, namely prosocial behaviour development and racial awareness. The findings of the Malaysian Child Development Project suggest that there is a clear developmental trend in both aspects of the children's social development. From ages three to six, the children show gradual but definite increase in prosocial behaviour as well as in their awareness of racial identity. In terms of sharing behaviour, the older children are found to be more willing to share. Urban advantaged children generally demonstrate greater generosity compared to the children from the more disadvantaged sectors. Perhaps the advantages that come along with the more favourable socialeconomic status enable them to be more generous than children from the other sectors.

As for racial awareness, findings from this paper suggest that the children are generally not aware of racial differences, even by age six as only one out of five children exhibits this behaviour.

The evidence from the Project has generally indicated that the children exhibit progressive ability in recognition of basic emotions and ability to empathise from age three to six. More children can recognise happiness and sadness as compared to fear and anger. Analyses of sectorial differences clearly show that urban advantaged children exhibit a greater emotional development than children from the other sectors but the differences tend to level off for all sectors by the age of six. An explanation for this levelling off effect is probably due to kindergarten experiences. In Malaysia, children from the urban disadvantaged, rural and estate sectors generally have a year of kindergarten experience just before entry into primary school, that is at age six. On the other hand, a larger proportion of urban advantaged children attend kindergarten at an earlier age, some as young as three years old.

In order to foster the child's socioemotional development, irrespective of gender, ethnic or sectorial background, the importance of a positive self-concept for the child cannot be over-emphasised. To develop a good self-esteem for the child, parents and teachers need to encourage resourcefulness, responsibility and reliability in the child. In cultivating resourcefulness in the child, it is important that the child is able to find something useful and interesting to do. Children can also develop resourcefulness when they have opportunities to find solutions to problems themselves.

Parents can assist the child to develop responsibility by encouraging them to take care of their own possessions. The act of caring for others can extend to caring for household things and for plants or animals in their home.

Likewise, it is important that children learn to be reliable and dependable. The ability to complete assigned tasks and to adhere to schedules in a flexible but disciplined manner should be encouraged. The ability to pay attention to simple instructions and remember them is equally vital.

In the final analysis, the socioemotional development of the child is a crucial component of the child's overall development. The role of parents and other significant persons in the child's environment is of paramount importance in shaping this development.

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Parental Involvement in Promoting Physical Growth and Development of Children

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The basic requirements for optimal growth and development of children are adequate and proper nutrition, a clean and safe environment, good personal hygiene, appropriate child rearing practices and protection from infectious diseases by measures like immunisation. As more mothers enter the working force and with the disruption of the extended family system, day care will be replacing home care as a cultural institution for rearing young children. In addition, it will play an increasingly important role in promoting their physical growth and development. Therefore, parents will need to involve themselves in child care centre activities so that their children will derive maximum benefits from them.

This paper (1) defines parental involvement, (2) outlines the benefits of their involvement, (3) identifies the barriers to parental involvement, and (4) suggests approaches that can be used to enhance parental involvement in child care centre activities.

1. What is Parental Involvement?

Using the framework of the child care centre as a place in promoting physical growth and development of children and adapting from WHO's definition of community involvement (1978), I would like to define parental involvement as a process by which parents assume responsibility for their child's health and develop their skills and capabilities to protect their health and enhance their growth and development.

Parental involvement may take place at several levels ranging from passive to active involvement. Parental involvement is passive if parents just utilize whatever services are provided at the centre. An active form of involvement is when parents are consulted on issues related to child care activities in the child care centres.

2. Why is there a Need for Parental Involvement?

An obvious reason is that parents have direct influences on their child's health. They are the most important teachers their children will ever have and they do not have the option not to teach their children. Child care centres of good quality will introduce healthy diets, good eating habits and hygienic practices to the child. However, if the same childrearing practices are not established in the home, the child will not derive maximum benefits from them. Therefore, the need to involve and educate parents on appropriate child rearing practices is crucial to establish some continuity between the home and the educative function of the centre.

Secondly, many parents, regardless of their educational levels and socioeconomic background, have their own skills and interests. Involving them in child care programmes will allow them to make valuable contributions to the centre that will benefit the child, child care centre staff and other parents.

Thirdly, some child care centre staff may find it frustrating if parents do not support their activities. However, if child care centre staff make efforts to consult them or get them actively involved, they are more likely to support their programmes.

Fourthly, parents also know best the needs of their children. Involving them will ensure the relevance and appropriateness of the child care programme.

Finally, parents can work collectively to improve the physical conditions in child care centres of inferior quality. Child care centres in Malaysia are very diverse with respect to funding source, number of staff and the standard of care. While it is noted that there are many good child care centres, it is still common to find centres of inferior quality, particularly in the estates (Khairuddin, 1984) and rural areas. Such centres do not have adequate or sanitary food storage and toilet facilities and the child minders usually lack training in child health. The adverse conditions in such centres may put the child at increased risk of acquiring infections. Parental involvement is, therefore, crucial in that parents can act collectively to contribute labour and resources to improve the physical conditions of the centre or to lobby for changes in the facilities.

3. What are the Barriers to Parental Involvement?

Encouraging parents to participate in centre activities may pose a problem in the day care setting. There are several reasons for this. Firstly, parents may not see the need to participate. This is particularly so in economically disadvantaged and socially deprived communities where parents have more urgent social needs and day-to-day concerns to address. They see the centre as a provider of custodial care while they work to augment their meagre income. They may not see the benefits of their involvement as they lack understanding of the functions and values of the child care centre in promoting physical growth and development. In addition, they may not be accustomed to the participatory approach of working closely with child care staff.

Secondly, there are parents who are concerned about the child's development and would like to be more involved with the child care programme but were unable to do so due to factors like time constraints, sociocultural differences, low self-esteem and self-perceived lack of skills. Time constraint is a significant barrier. After a hard day's work parents are just too tired to get involved and sometimes activities are organized at an inconvenient time. Sociocultural differences may also be responsible for lack of parental involvement. Child care staff may not fully understand the sociocultural background of parents and, therefore, could not relate to them. Parents' participation can also be influenced by their past school experiences. If parents have feelings of low self-esteem due to their past unhappy experiences with teachers, they may feel uncomfortable at the child care centre. This is sometimes misintepreted by staff as disinterest.

Thirdly, barriers to participation may come from within the child centre itself. Staff may believe that parents have little to contribute to the programme. To others, parental involvement may be seen as a nuisance. Staff may fear criticisms from parents of their methods of handling the children. Some may have had unpleasant experiences with parents that have biased them against all other parents, causing them to overlook the potential benefits of parental involvement.

Lastly, there is the situation where caregivers themselves are not trained. Some of the estate childminders may not even know the importance of proper nutrition and a clean environment for physical development of the child, what more, to involve parents in their activities. Even if they know the child's basic needs, they may lack skills to organize parent-child activities. Ironically, it is in this situation where maximum involvement of parents and child care staff is of paramount importance.

4. How can we Mobilize Parents to Participate in Child Care Activities?

There are marked variations in the type and quality of child care facilities in Malaysia. Some are private owned with trained staff and abundant resources to provide high quality care. There are others that are government owned or run by voluntary organizations or estates with limited resources. In view of their heterogeneity, no attempt is made to present a standard model to involve parents in day care. The extent to which parents get involved may vary considerably from one setting to another, depending on the resources and individual responses. Some general approaches for two distinct categories of child care centres are proposed: those adequately equipped centres which would like to involve parents for the child's benefit and those *have not* child care centres which would require an external change agent to involve parents to improve their conditions. It should be noted, however, that child care centres exist on a continuum, ranging from being providers of poor to excellent standard of care. Flexibility is the key to enabling parents to work closely with child care workers.

5. Well-Equipped Centres

For those centres that are keen to involve parents in their child care programme so that they and their children will derive maximum benefits from it, the following approaches are suggested:

1. Child care staff should find out more about the needs of parents by organising parent-teacher dialogue sessions at a time convenient to them or by other means, such as home visits. This could be a first step towards establishing rapport with parents and sensitizing them to their needs.

2. Parents should be adequately informed of the day care activities and their likely impact on children's development. In addition, any outbreak of infectious illness, such as measles or diarrhoea, in the centre and the steps taken to control it should be communicated to parents. This will increase their awareness and stimulate their interests in child care.

3. Child care centres should organize parent education classes and choose topics that parents want and would benefit. To ensure their relevance, parents should be consulted before organizing such classes. Areas of special interest to parents with young children may include nutrition, how to prevent coughs and colds, immunization requirements, first aid or safety in the home.

4. Parent educational activities should stress on stimulating learning-by-doing activities, such as practical cooking classes, group discussion, role play

and games, that deal with real problems of their children. These activities would encourage parents to want to be there and also are more effective methods than talks in equipping parents with skills. Parents could also share their experiences with each other. As parents may be busy, they should be informed of the activities well ahead of schedule.

5. Efforts should be made to involve parents in planning menus for the children to ensure that meals are not only nutritious but also socially and culturally acceptable to them.

6. Feedback should be provided to parents on the progress of the growth or the health status of the child. This could only be done if centres keep good records of the child and if child care workers are trained on child health and physical development.

7. Centres should compile a list of educational materials, such as books, cassette or video tapes, that parents might want to borrow and read. Child care workers have the unique opportunity to influence parents' interactions with their children. Also, with gradual disappearance of the extended family in the urban areas, parents are beginning to utilize their childrens' teachers as resources.

8. Child care staff should also know the community resources that are available to promote physical development of children, such as child health clinics or child specialists. They could then refer parents to such services as and when required. In this way, they play an effective supportive role to the parents.

9. Parent groups should be formed and involved in organizing activities like parent educational classes, nutrition programmes and field trips. Their skills and interests should be pinpointed at the time a child is enrolled. It is also important that child care centres show their appreciation, acknowledge the parents' contribution and recognise the value of their time.

10. Parents should be represented in kindergarten or child care committees so that they can contribute to the planning and modification of existing programmes to meet the needs of their children.

6. The *have-not* Child Care Centres

Centres in economically deprived settings may put children, many of whom may be malnourished, at increased risk of infections, such as coughs and colds, diarrhoea or Hepatitis A, due to overcrowding, lack of sanitary facilities and neglect of personal hygiene (Haskins & Kotch, 1986). Childminders in such centres may not be in a position to change conditions as they themselves are probably not trained in child care.

For such centres, professionals, voluntary organizations or estate management staff should help them form parent groups and instil in them the feelings of self-reliance to help their children achieve healthy growth. Many activities can be organized and implemented through such self-help groups. These include the construction of tables, chairs, food storage facilities and other items to help improve the physical environment and facilities. Parents can also be encouraged to start vegetable and fruit gardens or animal rearing projects for the children's feeding programme. They can also discuss with the estate management and other relevant agencies on ways to improve the quality of child care centres. United, they can lobby for needed fiscal and legislative measures to provide a better response to the physical needs of their children.

A study carried out by the author and her colleagues (Wong & Chen, 1991; Wong, 1991) on the Berawans in a remote area in Sarawak showed that it is feasible and effective to harness local resources to improve physical and social being of children. In their study, a group of mothers with four to six years of schooling were trained to collect and analyse data on health problems of their children. Cooperative planning between the women and the project staff resulted in the development of a kindergarten and feeding programme that was implemented and monitored by the women themselves. The fathers converted an unused hut into a kindergarten and constructed the tables, benches and food storage cupboards. The mothers were rostered to prepare food for the feeding programme. Vegetable and fruit gardens were started by parents to ensure the availability of food for the feeding programme. They selected a young girl from their village to be the kindergarten teacher. The Berawan children were taught on personal hygiene, nutrition and basic reading skills. Health education classes on nutrition and child rearing were also given to parents at the kindergarten. An evaluation carried out a year after the implementation of the kindergarten showed a marked improvement in the nutritional and health status of the children.

Conclusion

Child care is no longer a choice for many families; it is often a dire necessity. In the absence of abundant resources, parents and child care centre staff have to work together to guard our children in day care against unnecessary threats to their health and development.

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Parental Involvement in Children's Psychological Development

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This paper is in four parts: the first part discusses the importance of psychological development in young children; the second, examines three factors that significantly affect development; the third, looks at the three levels of parent involvement and in the final section, it recommends action to support more effective parenting.

I. Introduction

The psychological development of young children is a complex, dynamic process involving the interplay of the characteristics of the growing child and environmental factors. Although we often speak of physical, social, emotional, intellectual and psychological development as though they are separate entities, this is usually done for the purpose of conceptual analysis. In reality, not only are the boundaries blurred, but at any one time the social, emotional and psychological factors can be present.

II. The Importance of Psychological Development in Young Children

A positive psychological development affects the child not only in his present circumstances but also lays the foundation for his future functioning in his adolescence and adulthood. Good psychological development is often reflected in good mental health, ego strength, high self-esteem, sense of security, being socially well-adjusted, having an internal locus-of-control, whereas poor psychological development is reflected in low self-esteem and a variety of behavioural and mental health problems. The importance of children's psychological health has very significant implications for his success, social relations and well-being in his later years, and should, therefore, not be left to chance.

As the first primary caregiver, parents' role in children's development is paramount. Parents inevitably affect their child's psychological development, whether they are aware of it or not, by acts of omission (e.g., neglect) or acts of commission (e.g., abuse), and for better or for worse. The assumption is that parents want the best for their children, have some resources to do so, and, given the necessary information, skills and support, would be better able to purposefully nurture their child's psychological development.

III. Three Areas Contributing to Children's Psychological Development

There are three areas that warrant parents' involvement for the child's psychological development. They are: unconditional acceptance of child by parents, early childhood stimulation and experiences and finally, an understanding of child development, particularly child's temperament.

a) Unconditional Acceptance

Michael Rutter (1978) found that children who have a special relationship with at least one adult, managed to remain invulnerable to sources of stress, while others succumb to various physical, social, academic and mental health problems. In such relationships, there is unconditional acceptance of the child by the significant adult in his life. It is important that parents not only accept the child unconditionally, but the child himself should also perceive that he is accepted unconditionally.

Unconditional acceptance of the child means that he is accepted for what he is, regardless of his looks, his achievements and personality. Unconditional acceptance of the child, however, is not equivalent to unconditional acceptance of the child's behaviours which may be objectionable, for instance, aggressive behaviour, stealing and lying. Thus, while parents may accept the child they may not accept his behaviour.

Unconditional acceptance must be manifested in parents' behaviour and attitude towards the child. It is one of caring, loving, being there for the child, being responsive and sensitive. When there is unconditional acceptance, there is dependability and consistency that promote bonding and a sense of security in the child. A child who experiences such care and acceptance learns in turn to form caring relationships with other people.

b) Stimulation

Early childhood deprivation studies and outcome of early childhood interventions reveal that infants and young children need more than food and warmth to survive and thrive. They cannot survive and develop *by bread* *alone*. In fact, some have died whilst others have poor physical development, poor language skills, anti-social behaviours, behaviour abnormalities and mental deficiencies.

On the other hand, young children who have gone through early intervention programmes demonstrate improvements in IQ scores and other areas of functioning. Bronfenbrenner's (1980) survey of early intervention studies found that positive outcomes are likely to continue when the parents are involved in the programme.

Early stimulation is any activity that enhances the development of the child. Stimulation activities should begin at birth and continue through childhood. Parents do not require any sophisticated programme for their child's psychological development. An understanding of the principles behind early childhood stimulation can guide parents in conducting a variety of stimulating activities in the course of routine care.

Stimulation falls into the following categories:

Audio stimulation: Talking to child, telling stories and rhymes, singing, music, objects that make sounds, natural sounds in the environment (e.g. animal sounds, sound of water, wind, rustling leaves, traffic and so forth).

Visual stimulation: Colourful pictures, words, different objects, facial expression of adults, scenes of people, animals, shops - the list is endless.

Kinaesthetic stimulation: Moving the child in different ways (on his tummy, back and sides); placing the child on a swing, on a slide or a merry-go-round; skipping; hopping; jumping; etc.

Tactile: Tactile experiences provide the child with extra sensory discovery with sand, water, objects of different weight and textures. It also includes the child being touched and massaged, caressed and stroked.

Others: Stimulation also involves the sense of taste and smell. The point, however, lies not only in the activities themselves, but in the way these activities are carried out by parents and the significant persons in the child's life.

c) Understanding of Child Development and Temperament

While environmental factors will have an impact on the child, not every child will respond in the same way. How each child develops under similar circumstances depends a great deal on the characteristics and temperament of the child. Although children are generally resilient, some are more than others.

An understanding of child development can go a long way in developing a psychologically healthy child. Child upbringing is sometimes based on superstition and lack of understanding of how children actually learn and develop. A lack of understanding of children's temperament could also lead to parent-child conflicts and difficulties. How the *easy child, slow-to-warm-up child* and *difficult child* develop depends on what is termed by Thomas and Chess (1977) as 'the goodness-of-fit' between the child and the caregiver. If there is a clash of temperament, it is very likely that the child will display behavioural and psychological problems. Unless parents understand the child's temperaments, a difficult child's behaviour may be misinterpreted as being *wilful* and *stubborn*, which may provoke parents to exert an unnecessary harsh discipline, whereas a different strategy may be more appropriate to elicit cooperation and avoid conflict. This goodness-of-fit applies not only to relation with parents but also whenever there is a relationship between the child and any other persons and to any change in the environment.

IV. Level of Parent Involvement

Parents can be involved in their children's psychological development at three levels:

a) Direct involvement and interaction with the child;
b) Providing opportunities for different experiences;
c) Working in partnership with other care agents.

At each level, parents need to offer unconditional acceptance, stimulation and an understanding of childrens' development and temperament.

a) Direct Parental Involvement with Child

Parents have the most control over this area in meeting basic needs, providing unconditional acceptance and stimulation while keeping in mind the child's level of development and temperament.

Unconditional acceptance must be manifested in parents' behaviour if it is to be meaningful. Asian parents tend to hide their feelings and are distant from their children. Indeed, traditional parents, particularly fathers, do not talk much to their children except to give instructions, to reprimand or to inquire about school work and chores. Parents can demonstrate unconditional acceptance in various ways: physically through touching, patting, hugging; verbally, by telling the child parents' feelings for him, talking and listening; and being there for him in times of need. Food is a typical Asian way of showing love and care and should continue as one of the ways of showing love and acceptance for the child. This demonstration of acceptance, however, is not enough unless there is communication between parent and child. Most traditional and even modern parents have difficulty in communicating with their children. Without communication, misunderstanding, conflict and a rift can occur between parent and child, even though both parties may love each other. It is easier if parents initiate simple communication when the child is very young and continue to do so through his growing years. Communication, then, becomes a habit in the family and not only something to be used when a problem occurs.

Unconditional acceptance does not mean licence for the child to do whatever he likes. Children go through a socialisation process to fit into society and parents as the first socialising agent provide that necessary guidance. Young children require guidelines for behaviour through simple rules and regulations which are sometimes explicit (wash hands before dinner, be polite), sometimes implicit. They provide a frame of reference for the child to understand what is expected and permissible and help decrease likelihood of conflict between parents and child.

In setting rules, tasks and expectations of behaviour, parents need to know about child development, and age-appropriateness. Conflicts, stress and behavioural problems occur when parents over- or underestimate the child's ability. When a child is unable to fulfil a task repeatedly and is seen by parents as lazy or stupid, he will lose confidence, become resentful and hostile. Thus, in relating to the child, parents need to understand age-appropriateness of the task at hand and also the child's temperament.

Whenever a child has to be chastised, he must be made to understand that parents are rejecting his behaviour and not him as a person. Young children often equate an angry parent with a rejecting parent and will sometimes exhibit misbehaviour to regain parents' attention. The withdrawal or threat of withdrawal of love by a parent, whether real or perceived, is a traumatic experience for young children and should be avoided.

Stimulation is another area that is within the control of parents. There are traditional practices that enhance children's development and there are also practices that have a negative effect. The latter may have some social value at one time for the safety of children or is a result of superstition. When parents understand what practices enhance the child's development and what causes psychological damage and why, they would be better able to implement traditional practices selectively for the good of the child. Some simple principles can serve as guidelines for parents in deciding which traditional or non-traditional activities to engage the child. Parents need to know that:

i) Stimulation involves the various senses - sight, smell, hearing, touch and taste - either separately or in different combinations.

ii) Stimulation begins at birth. Mothers can hold and rock the baby, touch his face, whisper, sing and move with him. Both parents should be encouraged to interact with the baby. The traditional practice of baby massage is an excellent form of stimulation which is not only relaxing and pleasant for the child but also involves face-to-face interaction and changes of perception as the infant is moved from his back to his front and sides.

iii) Stimulation can be easily incorporated into daily routines of eating, bathing, getting ready for bed, doing the laundry and other housework. While bathing, the parent can allow the child to play with the water, blow bubbles, feel the slipperiness of soap, float different objects and watch the effect. Parents can talk to the child about his body as each part is being washed. During meal times parents can talk about food and later on look up pictures of fish in the sea and vegetables and animals in the farm. Before meals, the older child can be taught to lay the table for a specific number of persons, help sort and fold the laundry, separate fresh vegetables from yellowing ones and be involved in a number of *help mummy* chores. These activities not only promote thinking and problem-solving skills but also help in the bonding between parent and child.

iv) When engaging children in certain tasks, parents need to know whether the task is appropriate for the child. Parent's expectation of the child in performing the task should vary according to the child's ability at that age.

v) Parents should also be aware of the child's temperament. The easy child tends to be very responsive and, therefore, may be over stimulated while the slow-to-warm-up child may require more effort and time to be stimulated. If the child seems to be getting hysterical, then the stimulation may have to be decreased. If the child appears to be resistant, parents might want to introduce the stimulation slowly.

vi) Be sensitive to the child. If a child is unhappy with the task, then it should be stopped. If a child is getting frustrated over it, a little help should be offered. If the child is getting bored, activity has to be changed or be made more challenging.

vii) Finally, these activities should be enjoyable and not a chore for the child. It should also be an opportunity for parent and child to spend quality time together.

There are 3 areas of concern when parents are directly providing stimulation for children's development.

First, traditional parents tend not to play with their children except when they are babies. Mothers and fathers feel uncomfortable playing at the level of the child, particularly physical activities. Yet, parents are one of the most, if not the most, valuable playmates for the child. One can see the joy in the child's face when he is at play with his parent. Not only is the activity itself stimulating, it also helps build a closer bond between parent and child. Asian parents need to let go their authoritarian stance occasionally to play with their children.

Second, mothers are still regarded as the main caregiver for the young child, even when they are working mothers. However, there is a very slow increase in father's interest to be involved with their children. This could be attributed to smaller families and changing social expectations. In the past, fathers would be laughed at if they were seen minding or playing with their children which is perceived as women's work. Fathers' involvement in the care of young children does not only ease the burden of the working mothers, but it also brings an added value to the life of the child. Mothers and fathers interact in different ways with their children; they react differently towards boys and girls. In this way, father's play introduces a different element to the interaction while building up the relationship between father and son and father and daughter. For boys, this helps them to identify with the male role model.

Third, when both parents are working, the common problem is lack of time for the child. Research has not shown conclusively that working mothers will result in children with behavioral problems. The issue is not working mothers but the quality of care. Stimulating activities with the young child is still possible by involving the child in the household routine after work and by each parent taking turns to be with the child for different activities. Limited family time also calls for the prioritising of family needs. Such precious times should not, therefore, turn into *aggravation* times.

b) Parental Involvement Through Providing Opportunities for New Experiences

Parents need not and should not be directly involved in interacting with their child with the sole purpose of enhancing his psychological development. As the child's experience with the real world will encompass more than the immediate family, parents should widen his horizon by making opportunities available for new and varied experiences. These include making available play materials, playmates, visits to places of interests, exposure to nature, music, art and other experiences.

Of the various experiences parents can provide for a child, one very important experience especially for the only child, is peer experience. The quality of adult-child interaction is markedly different from that between peers. In an adult-child relationship, there is an obvious imbalance in favour of the adult. If the adult chooses, he can subdue and dominate the child, as in child abuse, or he can always give in to the child, as in the case of the spoilt and pampered child. But in peer relationship, unless one is much bigger than the other, the power is more or less balanced. It is within the peer setting that the child learns social survival skills - how to get what he wants (fights, negotiates, says "please", tells teacher, swops), how to get along with others and make friends (share, be nice, invite to party), how to increase power base (increase number of friends, bribes other children) and how to work cooperatively as a team (shares, takes turns, listens, discusses). Adults would not be doing children a favour by interfering, unless there is fear of real damage. Left on their own, children will solve the problem themselves. These interpersonal problem-solving skills lead to social competence.

Research in the area of peer relations reveals that there is a correlation between competence in establishing peer relations to subsequent adult functioning. Consistent peer difficulties in childhood correlate with dropping out of school (Roff, Sells & Golden, 1972; Ullman, 1957), schizophrenia and emotional and behavioral problems in adults (Cowen et al., 1973; Roff, 1961, 1963, 1972). Evidence also indicates that chronically negative peer relations are sensitive indicators of developmental difficulties (Hartup, 1976; Segal & Yahraes, 1979). Children who have low self-esteem and a sense of hopelessness tend to be more hostile and aggressive and are less socially competent compared to children with satisfactory relations (Gottman et al., 1975).

The role of parents is to provide opportunities for their children to be with other children. It is not too young for infants and toddlers to be exposed to other young children. The public playground, a regular gathering of cousins, neighbours and friends are opportunities for peer experience. When the child is older, the kindergartens provide somewhat different peer and other learning experiences.

Parents can also play a role in giving their child the opportunity to play in a multicultural and multiracial setting. Adults who seem to show greater tolerance and acceptance of other races and cultures reported that they had played with children of other races during their childhood days.

In peer situations, parents should intervene as little as possible. Overprotection does not help the child to fend for himself or increase his self-esteem. However, when he is constantly having difficulties with his peers, he may need encouragement, support and some help to deal with the situation. Parents should not dictate to the child what he should do and how he should interact. It does not foster independence, problem-solving skills and a sense of control.

c) Parents as Partners with other Care Agents

Finally, parents can also be involved in partnership with other people who share in the care of the child. Working mothers may share child care with live-in maids, foster parents, family day care providers, relatives or care providers in day care centres. In such instances, the child may actually be spending more time with others than with his parents. These other care providers may have considerable impact on the child's development, positively or negatively. In such a situation, it behooves the parents to be involved with the other agents of care.

A young child is dependent on the care provider for many things. Thus, selection of suitable care providers is very important. Apart from a safe and healthy environment, parents should look for warm and caring individuals. They should also have the child home daily, if possible, and discuss with the care agents the child's activities and behaviour while in their care. Parents should also be more sensitive to the child for any unusual change of behaviour that might indicate undesirable management of the child by the care providers.

in the selection of child care centres, parents should look for centres that are safe, staff who are caring and are trained, and a programme that is well-balanced. Parents should ask for regular conferences on the child's development and should keep the centre informed of the child's behaviour at home. In some organisations (e.g., the NTUC in Singapore), parent involvement is institutionalised. In these centres, parents initiate activities ranging from talks on child development to learning more about the programme and how they can extend it to the home. This close link between the home and the centre decreases the likelihood of conflicting messages from the home and centre that might confuse the child. Instead, this link will reinforce learning and ensure a sense of continuity and consistency in the child's life. When parents are not involved, the child may be living in two separate, compartmentalised worlds.

V. Support for Parents

A number of factors impinge on parents that affect their relationship with their children: economic factors, marital conflict, work-related stress, lack of specific child development knowledge and skills on parenting, parenting based on superstition and myths and lack of family support. All these could interact to make it difficult for parents to implement the various levels of involvement. Parents may need support as parents, as husband and wife and as individuals. Parents are not likely to be concerned with the finer points of parenting if they have problems in meeting basic needs and if they are stressed in trying to cope with office work and housework. Parents require both an informal network of support from relatives and friends and a formal network of social services.

Apart from the above, there are specific parent education support that needs to be advocated to help parents play a more effective parenting role. This approach takes an educational stance. It recognizes that parents do have certain strengths and abilities in parenting, but that they might need additional knowledge and perhaps new skills to enrich the upbringing of the child. The stance also recognizes that sometimes parents may need affirmation in what they do, to share with other parents their situations and to learn from one another. It is in this spirit that the following are recommended:

1. **National Parent Resource Centre:** The centre is targetted at both parents and those who work with parents. It would house resources and information related to parenting and family issues, publications in the local languages, and also videos and cassettes for parents with low or no education. The Centre can conduct specific skills workshops and facilitate the setting up of support groups to share information.

2. **Network of Mini Resource Centres:** Child care centres and kindergartens in urban areas can form a network of resources to service parents in the community. These network of centres can tap on the National Parent Resource Centre for support and resources.

3. **Mobile Parent Resource:** This is an outreach programme to serve parents in the outlying rural areas. This requires a para-professional and a van stocked with simple early childhood materials, children's books, multi purpose toys and games, puppets for story-telling, music and story cassettes as well as simple illustrated reading materials for parents. The para-professional could go from village to village to facilitate parenting sessions and to introduce the use of local and household materials for stimulating children's development, among other things.

Conclusion

Whether parents like it or not, they play a significant role in shaping the psychological development of the child, both directly and indirectly. With greater understanding of child development and support, their role is an irreplaceable one.

Parents can contribute significantly to their child's psychological development if they are perceived by the child to offer unconditional acceptance of the child, if they provide a variety of early childhood stimulation and if they, in implementing the above, mediate it with an understanding of the child's characteristics and temperament. Parents can and should involve themselves in their child's psychological development, directly in relating to the child and indirectly by providing opportunities for a variety of experiences, particularly peer experience, and by involving themselves as partners with the child's care agents.

To support parents in their role, a National Parent Resource Centre, a network of mini-resource centres working through child care centres and kindergartens and a mobile resource van to service the rural area, are advocated.

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The Child, Health and Child Care

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1. Introduction

The year 2000 is a critical year for health. It's a time for stock taking, for self appraisal on performances and a time for looking at achievement of goals. The Alma Ata Declaration was most specific that health should be accessible to all by the year 2000, using the universal vehicle of Primary Health Care. Following closely behind WHO's goal is UNICEF's accelerated programs for children "going to scale" to "reach the unreach" through GOBI-FFF. These are the missions of two major international organisations for health which ultimately will be adopted by governments which one hopes will trickle down to families and individuals.

Poor countries too have their own mission. Food in abundance will be just around the corner. The country's wealth is more equitably distributed. Government exercise its power with restraint and honesty. The people feel empowered. The poor and weak are treated with privilege. Child mortality will no longer be used as a barometer of health. The agent for change in health care is, at least, still through Primary Health Care. But it requires social mobilisation to bring in the appropriate messages.

But missions have a way of stumbling at the block without the support of the community and the individuals. Community support, on the other hand, requires understanding of the decisions made in the rarefied air of Mission Makers. The trickling down effect does not take place because family do not understand them or cultural and local differences have ways of putting the stamp of reality on the missions. Even worse still is when Mission Makers are out of touch with local and national problems and tend to use the same brush for everyone else: *What is good for us is good for them.* The lesson that one learns is that nothing works unless the community understands and is convinced enough to do something about it. The key mission for health, and the child in particular, is to allow the people to come to decisions which they feel are of their own making. The process goes something like this:

My child is ill. Where can I go?

Can I afford it?

Should I go to traditional health healers instead of the western trained doctors?

My child has survived. Can I prevent it from happening?

The government said "immunisation can prevent it".

Maybe I will, but I will talk to the neighbour first.

And so it goes on.

The decision making process is a far cry from the Mission Makers' perceptions. Understanding the community is, therefore, the beginning of successful child health intervention.

2. World Declaration on the Survival of Children

In September 1990, an important Declaration was issued by United Nation for the World Summit for Children where plans of action for child survival and development were detailed. The declaration outlines the challenges facing children. It makes dismal reading. United Nations being United Nations do not apportionate blame. But the effects of injustice on children are listed. The document protects the sanctity of Governments. Children, however, are the mirror of society. Their large eyes have always looked at the dark side of life with uncomprehending stare. The antics of humankind in war, for instance, have had devastating effects on child survival. They look at the passing of wars throughout history always with the promise that "this will be the last one". However, the promise was never kept. War with all its suffering is human's way of shooting themselves in the foot, ensuring that they stumble in the momentum of their development. Whatever gain made in health is efffectively negated during the war and the aftermath of war.

The list of injustices toward children has a familiar ring to it. The repetitive lithany of poverty, economic crisis, national debt, illiteracy, degradation of the environment, all have direct effects on the family and children. Unlike war but equally as destructive, are the effects of nations controlling other nations by fostering dependency and external debt. They have the patina of respectability, but their effects on the children are equally destructive. War for some countries are replaced by poverty, malnutrition and illiteracy. Lest one is accused of overripe imagination, the story of the Girl Child is worth detailing to highlight issues facing children as a whole.

3. Girl Child

Niraka Man Shrestra has this to say on the girl child ". . . the birth of a girl child is not a happy occasion at all and usually she is considered to be an unwelcome guest and the beginning of a painful story for herself and for her parents".

Discrimination against the girl begins early, even before birth. The use of amniocentesis and ultrasound enables parents to diagnose the gender of their baby in utero. The joy of pregnancy soon turns to dismay if the foetus is a girl. For some, the disappointment is removed by terminating the pregnancy. The prevalence of this practice will never be accurately documented, but Satymala, Sundram and Bhanot (1986) reported that in India:

> . . . aborted after sex determination. The policy makers too welcome this misuse of test because to them any action that leads to reduction of population growth should be encouraged.

The decision to terminate pregnancy, as a constitutional right of the individual, is an emotional event, bound to generate passions and lengthy debates. It splits the community apart. But curiously, even though it has been well documented, preferential abortion has never generated equally intense passions as the issue on abortion itself. If it did, the efforts were not sustained. The fact that the practice is regionalised and limited to a few poor countries has not excited the mass media enough to champion it as a human right issue. The critical mass necessary to condemn the practice never did materialise. Without critical mass, there is no pressure on the government to initiate changes. Governments, as in families, know their priorities.

Among the medical profession, this issue remains clouded. A survey in Bombay among gynaecologists excited these comments:

> Our priority is population control by any means . . . amniocentesis should be used as a method of family planning and made available to everyone at a minimum cost or even free.
> (Dr. S. Limaye, cited in Sathyarmala, Sundram & Bhanot, 1986)

> Sex determination is a social problem like dowry and child marriage and there is no point in blaming the doctor alone . . . .
> (Dr D.K. Tank, cited in Sathyarmala, Sundram & Bhanot, 1986)

Even in utero, the girl child lacks champions. It remains thus throughout her life.

4. The Girl Child on a Crossroad of Culture

To defend one's lifestyle as a part of one's national heritage and culture is considered safe and worthy of championship. Lifestyle has evolved through the fusion of ethnic roots, tradition and religion, giving it a distinctive stamp on the community. Over time lifestyles are finally absorbed as part of the nation's universal truth.

The influence of culture and behaviour are, of course, never pristine.

For instance, the Malays believe in:

> Let the child die but not tradition.
> (Malay proverb)

while the Nepalese have:

> A real man has a hundred wives
> A real man has a thousand girls to enjoy with.
> (Dr Nirakar Man Shrestha)

and the Chinese:

> Eighteen goddess-like daughters are not equal to one son with a hump.
> (Chinese proverb)

Culture has been protected from debate in international forums. There is an unwritten rule against its criticism. It is considered to be in bad form. But discrimination against the girl child keeps returning to culture as a major cause. Questions have been raised on the adverse effects of cultural practices on the girl. The issue can no longer be avoided. Each community will have to face the uncomfortable questions of examining their culture and its contribution to discrimination. One thing is clear - only the practitioner can change it. The outsider can only watch as an interested spectator.

Cultural practices fortunately are not cast in concrete. They undergo changes when they no longer serve the community. Like old laws, they are not repealed but are no longer practised. One would like to think that the change is always for the better. But changes, nevertheless, will take place, it is just a matter of time. The forces acting against culture are affluence, education, the rights of the individual, fragmentation of the extended family and the effects of the Global Village. An example is the nutritional practice where the girl child and women always eat last. In Malaysia, this practice is changing. It has been observed that small family size, affluence, improved status of women have contributed to the change. The effects of internationalisation, education which have common human rights objectives, rapid information system and the interrelated global economy will have profound effects on each national culture.

The question facing us is not whether culture will change or not, but how to hasten it. Until this is done, the girl child will sit on a crossroad, forever waiting in line for her dinner.

5. The Girl Child and Loss of Privileges

The philosophy for the privileged is simple to understand. Everyone covets it. Once acquired, it must be maintained. This requires considerable resources in term of goods and manpower. A system, therefore, is necessary to maintain privileges. The stronger the system, the better are privileges sustained. Privileges ensure the good life and once experienced, very few are willing to relinquish it. Hence, government and business works on maximising privileges with little costs. In a more formal term, this is referred to as *cost-benefit*. Even the poor family understands it. Referring to our preferential feeding practice, to the men who have enjoyed the privilege of eating the best of food, it will not be easy to make them relinquish it. The system to maintain this privilege is equated with power. It is like the President willing to share power with the chief clerk. Perhaps, the girl child understands this equation of power sharing.

Once this is understood, it does not make sense why the girl child and women in general should be so widely discriminated against. They fit nicely into the power system. To change the system is difficult because women and the girl child do not have powers that matter. The family, businesses and industries realise this. In particular, industries have consistently exploited the girl child as a commodity and cheap labour. The girl child has regularly replenished the prostitution houses in Bombay and Bangkok.

Mathura Shrestha (1990) commented:

> In Nepal too, every day hundreds of girls are abducted to bonded labour, to marriages without their consent, to sexual abuses and to prostitution and trafficking. It is estimated that more than 130,000 Nepalese girls and women are now forcefully serving as prostitutes . . . .

and Nirakar Man Shrestha (1990) added:

> Prostitution? Most of them are being sold by their own relatives . . . .

while in Thailand, Thonglaw (1990) said:

> Many studies have shown that *kaumkatanyoo*, the intention to pay a debt of gratitude to parents, together with parents' expectation for girl to assist with the household economy have pushed many girls into sex-related businesses such as by being masseuses and prostitutes.

Even among her family, the girl child does not find champions. The bottom line in business and manufacturing is to maximise profits. It is unusual to find social costs as part of the curriculum in business administration courses. One can conclude that the principle of social costs is incompatible with successful business practices. The litany of exploitation of the girl child and women are well documented (Shresthra, 1990; Sathyarmala et al., 1986; New Global Network; Shrestha, 1990; Islam, 1990). The actual costs to global business must be substantial if gender exploitation is removed. There will be loss of privileges. Business will not achieve maximum profit, and the community will no longer be able to enjoy cheap goods.

Cheap goods are the engines of consumerism. Consumerism is a form of privilege. Consumerism is the hall mark of a modern, affluent and successful society. It is a habit, an enjoyable lifestyle which is not easily weaned off. Once a way of life is established, it joins the ranks of universal truth. And once truth is established it must be protected to death, if needs be. In the case of consumerism, the source of cheap goods must be protected and goverments will predictably respond to the protection of life style and universal truth.

In the meantime the girl child will continue to fall between the cracks.

6. The Girl Child: Suggested Solutions

Can there be solutions to the problem? The close interweaving factors which have contributed to discrimination against the girl child make it an interesting academic puzzle, safe for debates but not really a subject amenable to solution. From time immemorial, exploitation and discrimination have always been part of the human history.

The issue on the girl child threatens to rock the fundamental structure of society. It dares to question such sacred cows as power sharing, privileges, governmental apathy, family power structure and business ethics. It is reasonable to conclude that the present *way of life* will not survive if discrimination against the girl child, and women in general, is not resolved. For many, the solution is *let sleeping dogs lie.*

However, positioned against powerful and personal interest is humanity's intangible quality known as conscience. It is the last bastion to prevent the total moral corruption of the human spirit. It usually acts by implanting the seeds of guilt. Conscience generates the need to redress something which is morally wrong, without recourse to the powerful argument of statistic and logic. One of the strengths of conscience is its ability to cross cultural and ethnic barriers, mobilising kindred spirits to act on a common cause. For the many who have been afflicted with conscience, they will march under this banner.

The instrument to redress the wrong, however, has not been invented. There is no magical bullet. There is no instantaneous cure. The solution works by attrition. It requires staying power. It requires mobilisation of critical mass and not driblets. It requires youthful energy and the continual reaffirmation for human beings to be something better.

7. Current Issues on Child Health

A. Child Infectious Disease

As we enter the 21st century, issues on children remain the same. Preventable childhood diseases still take a heavy toll for those under 5 years. Diseases, such as measles, polio, tetanus, tuberculosis, whooping cough and diphtheria, contribute substantially to infant mortality and morbidity. These are unfashionably low costs diseases to eradicate and health professionals have turned their attention to the more exotic AIDS. No special technology is required for the cure of childhood diseases. Their cure is assured and mundane to the extreme. All that is required are immunisation and accessibility to health care.

B. Gastroenteritis

Diarrhoeal diseases occupy a special place as a group of diseases that should not occur at all. Their prevention requires clean water and safe sanitation. Once these basic needs are fulfilled, the much harder tasks begin, that is, to inculcate in the child personal hygiene practices. Providing the child with facilities to wash their hands, however, is not as simple as it appears. Budgetary allocation is required on the part of the government. What invariably happens is that health programmes have to wait in queue once they enter the governmental planning machinery.

C. Children Do Not Live in a Vacuum

Children do not live in a vacuum. Their healthy growth requires adult and maternal support. Their lives are interlinked with their parents'. Parenting therefore, is a major task. Children have to be nurtured. Illiteracy is a major stumbling block to intelligent parenting. It is important that parents themselves should have access to basic education to reduce the illiteracy rate and to enable them to acquire parenting skills.

D. AIDS

A new disease which threaten both adults and children is AIDS/HIV. At the moment, there appears to be little hope of a cure. One is left with public health education as a tool for the prevention of AIDS. An important factor for their prevention is still the ability to persuade the community to curtail high risks behavior. The steady increase in AIDS victims calls for more than just a change in high risk behaviour. A recent report from Thailand revealed that 17 out of 18 child/teenage prostitutes rescued recently by the Thai police from a brothel had the AIDS virus. The girls were also suffering from other venereal diseases (Charan Sanit, 1991). The Thai experience indicates the spread of AIDS from smaller groups of homosexual and drug users to the general population. There is no reason to doubt that the same will not occur in Malaysia.

8. Summary on Health and Child Development

The United Nation's Document on the current need for child development is like an old lamp repainted. The causes are timeless and mundane; they still remain the same:

a. To recognise that children have the rights as an individual and are future citizens of the country.

b. They have rights to food and nutrition.

c. Children cannot live in a vacuum. They have close bonding with women, maternal health and family planning.

d. Parenting is a difficult business at the best of times. Basic education and adult literacy is, therefore, important.

e. War has always marched in steps with humankind and will continue to take place. It is important to provide, at least, protection for children during war through a *safe corridor*.

f. During difficult economic times, children are the first to suffer. It is essential to understand economic development and their effects on children.

g. There is a need to understand how economic growth can be revitalised to minimise the impact of hardship on children.

h. As the pace of development accelerates, environmental issues are becoming more important to the general health of the population. Safe drinking water is threatened, atmosphere is contaminated with carbon monoxide and heavy metals. All these have serious consequences on the health of children. Protection of the environment will be a future major issue in child survival.

9. Child Care Centres

The earliest study on child care in Malaysia was commissioned by the Ministry of Social Welfare to Khairuddin Yusof, Ooi and Hamid-Don. They were asked to

a. provide an overview of child care services in Malaysia;

b. design a monitoring system to help childminders and relevant personnels assess the standard of child care at the centres;

c. develop a series of policy recommendations for implementing *better child care* (Yusof et al., 1987).

Some of the relevant findings will be described. In this study, it was found that child care facilities were more readily available to the middle and upper class families who could afford them. The 24-hour childminding services were used primarily by young professional or semi-professional couples whose average monthly income was $910.

Seven factors were detailed to provide guidelines on how to monitor child care centres. They were based on physical facilities, environment, planned programme, staff:child ratio, educational level of staff, child health knowledge of the staff and the principal's attitudes on child placation. Of the three types of child care centres, home-based, institutional and estate-type (Yusof, 1983), the last did not stand favourably in terms of quality and content of child care. The majority of them (96.4%) were considered to range from bad to very poor. It was recognised then that early childhood period is a critical age for the child. The way he sees the world, exposure to wide ranging activities and the loving human contact he receives will play an important part in determining his intellectual and psychological development and approaches towards life. It was then strongly recommended that the child should receive adequate mental stimulation during the formative years. During the study, it was observed that child care centres were merely exercising custodial functions and not fulfilling their role as child development centres.

The study was initiated nearly 10 years ago. Has the practice of child care centres changed much since then? The Malaysian society has certainly undergone major transformations within the last decade. Her economy is more robust and is developing at a fast pace. Poverty is declining in most states, although not at the same rate. Pari pasu with this is the decline in infant mortality rates in most states. Economically, Malaysia has adopted the concept of regional development, hence creating a pull mechanism for population shift. People and family still move to the Klang Valley, Johore growth triangle and the free trade zones of Penang. When people move, the extended family is disrupted. More nuclear families are emerging. Malaysians now are urbanised with all the trappings of a highly sophisticated urban society.

The role of women too have been noticeably different. The problem of the girl child will slowly change as women acquire more economic power and status. Life, however, in an urban environment is not easy. Family requires a double income to live comfortably. Jobs are easy to get. Many women are now working. This raises a pertinent question on parenting and mother-child bonding. Most women feel that the role of parenting should be shared with the men. Others feel that the shorter time spent with the child is *quality time* which is comparable to or even better than the previous *quantity time.* Domestic live-in helpers are more difficult to obtain. Many urban households are recruiting help from the Philippines. Some have illegal Indonesian maids. Is the role of parenting now shared with maids from Phillipines and Indonesia? The danger of surrogate parenting is that belief and philosophy of the maids may not always be in congruence with those of the real parents. Under these conditions, several questions will need to be raised:

1. Who will replace the role of parenting now that Malaysian women are slowly emerging as an economic force and assuming more active roles in shaping the Malaysian society?

2. Are Malaysian men willing to share the responsibilities of parenting? If not, who will fill the vacuum of parenting?

3. Will child care centres ultimately assume the dual roles of child development and surrogate parents?

The Malaysian society is rapidly changing. The slow moving aggragrian pace is now replaced by the hustle and bustle of a society undergoing urbanisation. With tertiary education made available to all, women's expectations are raised, their traditional roles are being re-evaluated and their contributions as an economic force further enhance their status within the family. Malaysian men who traditionally have assumed the mantle of the household, and, for decades, have a comfortable and clearly defined role, will themselves need to undergo a mental revolution. How will they contribute to parenting? In these changing times, there is a danger of the child falling between the cracks. The function of the child care centres will need to be positioned in the wake of these changes. One is tempted to conclude that child care centres of the future, whether institutionalised or home-based, will have to play the more important role of child development instead of that of a passive custodian. They will, to a certain extent, fill in the gaps of parenting. One anticipates that a symbiotic relationship will be forged between parents, the child and child care centres. It is too much to expect that the Malaysian society will revert to what it was before. It is easier to accept the fact that the developmental process is unidirectional.

10. Child Care and Child Health

Child care centres have other responsibilities besides child development. They are expected to keep health records. Infectious diseases are common whenever there is a high concentration of children. Routine medical checks of children should be maintained. The question of whether child care centres could be integrated as part of the health care system will need to be debated. It is a grand opportunity to practise preventive health care to a group of children, who were already captured as it were. Some of the health activities would include nutrition, hygiene, monitoring of growth, immunisation and dental health. There are 1.9 million children under 5 years in Malaysia. Based on the number of working women, at least 30%, will require some kind of child care services - home-based, institutionalised or estate-type.

One estimates that at least 700,000 children under 5 will need health care. A more important aspect on preventive health is the behaviour modification for those with high risk behaviour such as smoking, obesity, alcoholism and drug addiction.

Conclusion

Child survival is a global problem. It was contributed partly by humankind's negative behaviour towards its most vulnerable asset. The child is the unwitting victim. Child care centres which have emerged as a natural developmental process should expand its role to enhance child survival.

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Psychological Development in Child Care Centre

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Most parents assess the quality of child care centre by its teaching programme, that is, the degree the centre gives attention to intellectual development. But, intellectual potentials are not the only potentials that need to be nurtured as the child does not consist of the head only. What good will intellectual development be to the child if intellectually he is an achiever but psychologically he is a cripple, lacking in social intelligence and emotional stability. Most of us are familiar with the nursery rhyme, *Humpty-dumpty*. He must be an epitome of a child whose intellectual development has been developed at the expense of the other areas of development, particularly his physical and social development. His thin legs and arms and a hardly noticeable body are indications of neglected physical development.

Have you ever wondered why Humpty-Dumpty was sitting on the wall by himself? Is it not more natural for young children to be with their playmates? Could it be that the other children have rejected him and would not have anything to do with him? Or could it be that Humpty-Dumpty was unable to relate with other children? Whatever the reason may be, Humpty-Dumpty appeared to be a social isolate, a social failure.

Although Humpty-Dumpty's head was swollen with fact and information he did not demonstrate to possess much common sense. If he had the ability to think and reason, he would have realised that, with a big head and a small body, sitting on the wall could be extremely dangerous. Could it be that although he realised the danger, his reason was overruled by his need to be with the other children? Is it possible that Humpty-Dumpty was trying to attract the attention of the other children? No matter what reason we attribute to his precarious perch on the wall, the sequel to this story remains unchanged - Humpty-Dumpty fell and in spite of all efforts (all the king's horses and all the king's men), Humpty-Dumpty could not be put together again.

Have you ever wondered why did the author write such a tragic story for little children? Could it be that the author was recounting his own childhood? Could it be that between the lines was this plea of a little boy to his parents "Please do not do this to me. Let me grow up like a normal child. Let me have my childhood. You are destroying me by concentrating on my head alone."?

This story has such a familiar ring except that the behaviours displayed by the humpty-dumpties of today's society are different. The behaviours - self- and other-directed - include vandalism, social withdrawal, hyperactivity, truancy, school refusal, school phobia and dropping of school and/or society. The desperate cries of parents can be very heart-breaking. To cite some of them: "I do not know my child anymore - suddenly he broke all the things"; "it scares the life out of me to see him kill every one of his pets (rabbits and hamsters)"; "he just cannot sit still"; "she refuses to go to school and begins to cry when she is made to do so"; "she refuses to say anything, not even when I beg her to speak to me"; "we have seen so many specialists and none of them could find anything wrong with her leg". The majority of these children are teenagers. This is because most of the consequences of emotional abuse are not manifested immediately but, generally, at adolescence or adulthood. However, in recent years, these stress and frustration symptoms are expressed progressively earlier - even during early childhood, implying that the stress is so great that the threshold is reached before adolescence.

1. Basic Principles

a) Home and Child Care Centre:
Complementary Philosophy and Practices

Although this paper is concerned primarily with promoting psychological development in child care centres, the same principles are applicable at home. In fact, both the home and child care centre should complement and supplement each other in the child's development. If the home and child care centre have conflicting values and philosophy, then the child is confused as he/she has two sets of values and behaviours, with one set being approved by the home and may even be punished by the centre while the reverse is true of the other set. Having to know which set of behaviour to apply in different situations can create fear and anxiety. Therefore, to foster psychological growth and good mental health in children, the first principle is for both the home and child care centre to have similar child rearing practices and expectations.

b) Development of Whole Child

Psychological development of children includes intellectual (or the better term, *cognitive*), language, social and emotional development. Our study, the Malaysian Child Development Study, indicates that these areas as well as physical development are inter-related (Chiam, 1991). For instance, ill health can impair the child's intellectual, social and emotional development. Likewise, emotional instability can holdback intellectual and social advancement. Development of one area at the expense of the others can ultimately, as in the case of humpty-dumpty, destroy the child. Therefore, the second principle is to develop the whole child.

c) Trained Caregivers

Studies have shown that interactions between child and significant others are of paramount importance, especially during the early years. The interactions are even more essential than the provision of play and educational materials. In Bradley and Caldwell's study (1976), the correlation between the child's mental test performance and provision of appropriate play materials is .56 while the correlations of child's mental scores with emotional and verbal responsivity of mother and with maternal involvement are .50 and .55 respectively. Thus, while provision of play materials contributes to 31.4% of the variance in the child's mental scores, the two maternal components together are responsible for 86.6% of the variance. Crokenberg (1983) and Plomin and DeFries (1983) also found the child's level of competence and cognitive learning to be facilitated by mother's responsivity and sensivity to the child's needs, especially in the first two years of life. In Thomas' ethnographic study (1991), the preschool child who engaged in conversation with her mother used longer and more creative sentences than those who utilised educational games and workbooks. According to Bever and Garrett (1974), the opportunity to engage in conversation with adults facilitated language acquisition.

The findings of the National Day Care Study (Ruopp et al., 1979) suggest that the attitudes and behaviours of the caregivers have a greater impact on children's development than the curricular offerings of the day care centre. Children whose caregivers comfort, praise and provide them with guidance have higher standardised IQ scores than those whose caregivers do not display such behaviours. Therefore, the third principle requires caregivers to be trained in early childhood education and child development to equip them with parenting skills and knowledge of child development so that they can acquire behaviours that permit them to interact effectively with children.

d) Physical and Psychological Safe Environment

Children must feel safe and secure in the child care centre. Safety does not refer to physical safety alone but to psychological safety as well. In fact, it is much easier to ensure that the child care centre is physically safe and parents, generally, encounter little problem in assessing the physical safety of the centre. Psychological safety is harder to attain and even more difficult for parents to make the judgment. Threats can be emitted from both the caregiver and the children. Furthermore, threats can be verbal or nonverbal. It is not uncommon for caregivers to use threats of punishment[1] or withdrawal of affection to control children's behaviour. Such tactics imbue fear and feelings of insecurity because acceptance of the child is not unconditional and is contingent to approved behaviour.

No child can learn or acquire cognitive, language and social skills if she feels threatened or insecure. Learning that takes place in an environment of uneasiness will imbue in the child negative attitudes towards learning. The child's emotional development will also be affected by her feelings of fear and insecurity. Consequently, the fourth principle is the provision of a physical and psychological safe environment in the child care centre.

2. Cognitive Development

To most parents, intellectual development is of utmost importance and knowledge is the index of intelligence. Knowledge by itself serves little purpose if the child does not know how to utilise it. For knowledge to be functional, the child must have already acquired two basic cognitive skills which are reasoning and problem-solving. However, our data indicate that only 46.8% of the six-year-olds have mastered reasoning skill (Chiam, 1991b). Of this percentage, 63.7% are from the urban advantaged communities, while only 17.1% are from the estates. As for problem solving, only 43.7% of the six-year-olds have mastered this skill, with 59.0% from the urban advantaged areas and 8.6% from the estate.

An examination of the preschool curriculum reveals that there are few activities which are designed to stimulate children to reason and solve problems. Yet, it is not difficult to incoporate these cognitive skills in preschool children's activities. In fact, few of the curricular offerings in preschools are designed to assist children acquire specific cognitive skills. Yet these skills are essential to the child's cognitive development and many activities can be used to facilitate this acquisition. For instance, ability to classify can easily be fostered by providing children with different counters, flowers or buttons of different colours and shapes.

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1) Threats of punishment is not the same as discipline.

Acquisition of knowledge features prominently in the curriculum of the majority of the kindergartens in Malaysia. But, mastery of the cognitive skills attainable at each stage of development is more important than the mere acquisition of knowledge. Therefore, preschools should identify what are the cognitive skills available to the children and provide activities which will facilitate the development of these skills.

3. Language Development

The data of the Malaysian Child Development Study (Table 1) indicate that, unlike the higher order cognitive skills (reasoning and problem-solving), the gap in language development between urban advantaged and estate children decreases with age. The progressive decrease in the differences can be an indication of the influence of kindergarten. As acquisition of vocabulary and language fluency is a main activity of kindergarten, progress in language development is expected, especially in children from deprived homes.

With regard to language learning, children in disadvantaged sectors are, in many cases, better off. Their teachers are fairly good models of the language they are propagating (Malay, Chinese or Tamil). On the other hand, quite a number of the teachers in urban advantaged kindergartens are poor models for the acquisition of the English language because of inaccurate pronunciations, grammatically incorrect sentences and poor sentence structure. This problem is not an easy one to solve as it is difficult for preschools to attract good and qualified language teachers, owing to the low status and pay.

Table 1: Language Development by Age (In Means)

	Age (In Years)			
Sector	3	4	5	6
Total	19.17	22.53	25.82	28.22
UA	21.26	25.02	27.77	30.46
UD	18.57	22.04	27.00	29.06
RU	18.54	22.16	25.08	27.06
ES	16.92	20.03	23.24	26.48

(Maximum Score = 59)

Language development does not consist of increase in vocabulary only but also in length and complexity of the sentence. It also includes the ability to express thoughts clearly in verbal as well as in written form. Hence, teachers should create situations which promote talking. Dramatic play is a good vehicle for developing the ability to construct stories and competence in narration which can also be facilitated by presenting pictures for children to describe. In fact, child care centres, nurseries and kindergartens offer countless opportunities for language development.

4. Social Development

Child care centres provide opportunities for the child to become socialised. Man is a social being and children, even as young as a few weeks old, are interested in others and want to relate to them. Quite often, the main reason for placing an only chiid in a child care centre is to enable him to interact with his peers. According to Erik Erikson, the major social task of preschool children is to develop relationships with others. Through peer friendship, children develop concepts of cooperation, mutual respect and interpersonal sensitivity which can be generalised to other types of social relationships. Piaget believes that through play children recognise the necessity to abide the rules of the game, cooperate and take turns. Hence, play is the principal means by which children learn to relate to others.

In any social group, there are some who are popular and well-liked while others are not. Unpopular children can be either isolates and they choose not to relate to others or they have attempted to interact but are rejected. Roopnarine and Honig (1985) observed that unpopular children are either shy and withdrawn or are disruptive and aggressive. Rubin (1982) found that peer rejection during primary school years is predictive of school dropout, antisocial behaviour, delinquency, sexual disorder and psychopathology in adolescence. Hence, it is highly desirable that isolated and unpopular children are identified early and helped to develop social skills.

Roopnarine and Honig (1985) found unpopular children to have certain common characteristics. These children tend to use more verbal and physical aggression. When they try to make contacts they are either ignored or rejected. As a result, they wander, look on and hover at the periphery of the activities. The mothers of these children are more likely to possess poor self-concept; they seldom praise their children for good behaviour and do not foster independence. The fathers rarely interact with their children and regard child rearing to be the responsibility of mothers. In contrast, popular children have warmer and more supportive parents and are likely to be secure in their attachment to their mothers during infancy.

To assist unpopular children to acquire social skills, Roopnarine and Honig (1985) suggested that the care providers can

a. Gradually introduce unpopular children to social groups by involving them in activities with one or two other children.

b. Use puppets, role playing and books about shy or lonely animals or children who learn to make friends.

c. Enhance children's self-esteem, provide clear rules along with reasons for the rules, and model warmth, nurturance and attentiveness.

d. Include the development of prosocial behaviour as an essential part of the curriculum for young children.

As parents are primarily responsible for the children's behaviour, caregivers have to work with them and get their cooperation. Hence, caregiver should

a. Enlist parents' help by assisting them in the development of positive discipline techniques.

b. Encourage parents to find playmates for their children.

5. Emotional Development

Emotional and personality development have been given the least attention in child care centres and preschools. Consequently, the major part of this paper will be focussed on these two areas. Often parents and caregivers are so concerned with children's cognitive and language development that they overlook the fact that children have feelings. By the time they reach preschool stage, children have a well-developed set of emotional responses. For children's mental health, it is important that they have the opportunities and methods to express them. Formation of secure attachment bond is not only basic to later successful socialisation but also to cognitive development. Children who feel secure in their relationships with their parents and caregivers have the courage to strike out on their own and explore the environment. This security enables them to trust in others and the environment. The trust which develops through secure attachment also provides the basis for the development of autonomy and initiative. Secure children also use more positive behaviours when interacting with their peers (Hetherington & Parke, 1979), thus promoting peer relationships.

a) Fears

Fears, like other forms of emotions, become more highly differentiated as the child grows. Infants, for instance, are afraid of loud noise and strangers but older children grow out of the fear of strangers and are fearful of certain type of loud noise only, such as thunder. However, they become aware of other kinds of danger and threats (such as height and monsters). Fears develop from a combination of genetic and learned factors. Genetically, as the child grows older and becomes more advanced cognitively, she can respond to more stimuli in the environment. Fears are also acquired through conditioning and observational learning. Caregivers should, therefore, avoid instilling fears in children, for instance, with threats of ghosts and vampires. Neither is it healthy to tell the child not to be silly as this will only make him feel stupid and guilty. The best strategy is to help the child work through his childhood fears by (a) talking about the fears; (b) providing opportunities for dramatic play and (c) desensitising the child to the feared objects, for instance, by singing or telling stories during thunderstorms.

b) Aggression

When one's goal is blocked frustration is felt and this is expressed in aggressive behaviour which takes the form of hostility or anger. Feelings of this kind are seen even in infants - they cry in anger when their hunger is not satisfied. Feelings of frustrations and anger appear as temper tantrums in toddlers, and in preschool children, these feelings are expressed physically. The problem for the young preschool child is to learn to control the expression of angry and hostile feelings. Although children have the right to experience anger and frustrations it is essential that they learn socially acceptable modes of expression.

Parke and Slaby (1983) pointed out that preschool children encounter frustrations several times a day. For instance, when they ask for something and are told they cannot have it or they try to do something and fail. Thus, they suffer from frustrations and affronts to their dignity. Therefore, it is hardly surprising that display of aggressive behaviour is frequent in preschool; frequency of physical aggression reaches its peak late in the preschool years.

Patterson (1982) proposed that aggression originates in the behaviour modelled by significant others, notably parents, and is maintained by their parents' responses to them (for example, parents' mode of punishing). Children who are exposed to a great deal of violence at home or who are given little affection and attention often use hostility in their interactions with others (Feshbach, 1980; Feshbach & Feshbach, 1976). Heavy dosage of TV violence can affect children's attitudes toward it and can lead them to view violence as an acceptable and effective way of resolving interpersonal conflicts and they may even become indifferent to real-life violence (Thomas & Drabman, 1977).

As aggressive behaviour is learned, shaped and maintained by reinforcement and other social forces in the child's environment, this behaviour can be monitored and regulated by providing appropriate models and experiences. Aggression can be decreased by igoring aggression and rewarding cooperative and peaceful behaviours. It can also be controlled by reprimand. An alternative method is by making the children aware of the negative consequences of aggression through explanation or role play or puppets. Another effective way is to make someone laugh as humour is a reaction incompatible with aggression.

Parke and Slaby (1983) suggested graphic display of the anguish of the victim. However, this may not be always effective as aggressive children may see signs of pain and suffering as indications that their act of aggression is effective. Similarly, the belief that providing opportunities to work out aggressive tendencies (with punching bags, pounding boards, Bobo dolls and toy guns) will reduce hostile behaviour, has been found to be a myth (Mallick & McCandless, 1966; Baron, 1978). The findings of these studies indicated that, instead of draining off aggressiveness, the aggressive experiences promote them.

The environment can promote aggressive behaviour. Crowding, insufficient facilities or equipment and stress can increase aggression in children. If, for instance, there are not enough swings or toys for the children in the nursery, preschool or day care centre, the children will jostle for possession which will inevitably result in pushing, quarrels and fights. Aggressive toys are more likely to produce aggressive behaviours.

c) *Altruism and Empathy*

While aggressive behaviour is to be discouraged, altruism and empathy are to be fostered. An altruistic behaviour is a voluntary or intentional act that benefits another and is not motivated by any desire to obtain external reward while empathy is the ability to vicariously feel another person's emotions. Both of these feelings are available to young children as demonstrated by the offer of one's toy to another child in distress.

The findings of the Malaysian Child Development Project show that even the three-year-olds can empathise and more of the older ones can empathise than the younger ones (Table 2). The data also disclose that urban advantaged children are generally more empathetic than their less privileged agemates, the estate children being the least empathetic. The data suggest that deprived children who perhaps do not receive much love and attention, are less capable of altruism and empathy. This result seems to be in agreement with the finding of Main and George (1985) who observed that abused children responded to distress in their agemates with physical attack, fear or anger, instead of sympathy.

Table 2: Empathy by Age and Sector (In Means)

Age (Yrs)	All	UA	UD	RU	ES
3	1.08	1.26	1.13	0.89	1.07
4	1.75	2.26	1.57	1.64	1.45
5	2.48	2.84	2.64	2.32	2.28
6	2.81	3.04	3.14	2.61	2.43

Maximum score = 4

To love others, children must receive love themselves. Hence, to develop altruism and empathy in preschool children, caregivers must have the capacity to love children, and are altrusic and empathetic.

Altruism and empathy are prosocial behaviours. Since children learn better through cooperative play than through competition these two traits should be encouraged to develop in preschool children, especially as our data indicate that preschool children are capable of being altruistic and are able to empathise. The encouragement of these two prosocial behaviours also reduces the formation and expression of aggression. Where there are more prosocial behaviours and less aggressive ones, discord among the children will be greatly reduced. The less stressful the environment, the more conducive it is for social interactions and learning.

Children learn to behave generously towards others from exposure to warm, caring adults who display altruistic behaviour themselves. Children who have a history of consistent exposure to caring adults tend to behave altruistically in situations where generosity and helping are appropriate even though the nearby adult's behaviour is selfish (Lipscomb, 1982 & 1985).

Although we did not test for altruism, the ability of the child to share can be used as an indication of the possession of this trait. The data presented in Table 3 show that younger children are less inclined to share while more of the older ones are either willing to give the extra wafer to the tester or are prepared to share it.

d) Happiness

Happiness which is an expression of positive emotion, is manifested by smiling and laughter. It serves as a mechanism for releasing tension and expressing pleasure at cognitive mastery. It also serves a vital social function as it solicits approach and positive responses from others. Furthermore, smiles and laughter motivate parents and caregivers to be affectionate and encourage goodwill in them. Laughter, which is a more intense expression than smiling, can stimulate the child physically and audibly.

Infants can smile soon after birth and, by the fifth week, their expressions of well-being are often accompanied by movements of arms and legs. Parents and caregivers should encourage this positive emotion by smiling at the infants or by responding positively to their smiles and expression of well-being. For preschool children, this feeling can be promoted by praising or expressing pleasure at their efforts, laughing at their jokes, enjoying their joy, and helping them to laugh at themselves.

6. Personality Development

In psychological term, personality does not refer to the impact a person has on another person but to the qualities which characterise the person. These qualities determine the behaviour of the individual and, hence, we can predict the person's behaviour from his personality. Although temperaments and personality dispositions or tendencies are inherited, environmental factors

Table 3: Sharing Behaviour by Age and Sector (In Percentage)

Age (Yrs)		All	UA (647)	UD (648)	RU (1087)	ES (317)
3	I Take It	53.0	54.1	53.3	49.8	58.1
	You Take It	16.5	16.7	16.8	15.6	17.5
	We Share	30.5	29.2	29.9	34.6	24.4
4	I Take It	41.3	34.4	40.1	44.5	47.8
	You Take It	25.7	32.3	24.2	23.9	20.4
	We Share	33.0	33.3	35.7	31.6	31.9
5	I Take It	25.0	25.9	27.3	22.7	28.4
	You Take It	44.1	51.8	39.0	44.4	39.8
	We Share	30.9	22.3	33.7	32.9	31.8
6	I Take It	23.0	18.4	16.0	27.5	33.3
	You Take It	45.6	59.2	36.1	47.3	26.7
	We Share	31.3	22.4	47.9	25.2	40.0

shape children's behavioural tendencies and determine to what extent the temperamental traits (such as introversion, extroversion, anxiety and impulsivity) are developed.

a) Self-concept

Self-concept, the core of personality, is defined as a person's perceptions (or understanding and evaluation) of his personality, qualities and capabilities and is the directing force behind a person's behaviour. In other words, a person's behaviour is consistent to his self-concept or self-image. You can test the truth of this statement. You had been, I am sure, in situations where you feel adequate and comfortable and also in situations in which you feel inferior to others. Your behaviour in these situations, I am sure, was not the same. In the first situation, you were able to behave naturally and enjoy yourself. In the second situation, you had either kept quiet or, in an attempt to hide your inferior self, you had talked more and much more loudly than normal.

Self-concept is formed through interactions with others, that is, the person's idea of what she is, and what she is capable of doing and achieving is derived from the way others react towards her and the way they evaluate her efforts. Self-concept is often referred to as the *reflected self*. Thus, the children's self-concept is formed from the way others, especially significant others (parents, caregivers, etc.), treat them, react towards them and evaluate their efforts. Giving attention to what the child says, supporting his efforts and initiative, praising him for his efforts will contribute towards a positive self-concept. On the other hand, a child who receives more criticisms than encouragement, is frequently told what he has done wrong rather than what he has done correctly, and whose performance is being compared unfavourably with others, will have a negative concept of himself.

Coopersmith (1967) found that parents' attitudes and childrearing practices are predictive of the child's self-esteem (feelings of self-worth). Children with high self-esteem often had parents with the following characteristics:

1. The parents were accepting, affectionate, and involved in their child's life, treating his interests and problems as meaningful, and showing genuine concern for him.

2. They enforced rules carefully and consistently, and they set clear limits to what the child could and could not do, encouraging him to uphold high standards of behaviour.

3. They used noncoercive kinds of discipine, such as denial of privileges, and they typically explained to the child what he was being punished for and why his behaviour was inappropriate.

4. They were democratic in their interactions with the child, often considering his opinions and allowing him to participate in making family plans when appropriate.

Coopersmith observed that when parents considered the child's opinion and allowed him to express himself, they conveyed to the child that they think he is an important and worthy individual. Hence, the child learned to regard himself as such. He also noted that setting clear and realistic limits and being consistent in their expectations lessened the chance of the child's failure to meet parental standards of behaviour. The child has difficulty to monitor, evaluate and regulate his behaviour if the standards of behaviour expected of him are ambiguous and inconsistent. His findings are supported by many researchers. Among them are Baumrind (1971) and Loeb, Horst and Horton (1980).

Coopersmith's findings are equally true of childminders and kindergarten teachers, that is, preschool teachers and childminders who are warm, accepting and affectionate, enforce consistent discipline, and who are democratic in their interactions will instil feelings of well-being, confidence and personal worth in children.

The children with positive self-concept behave differently from those with negative perceptions of themselves, as shown in Figures 1 and 2. Those with positive self-concept tend to be friendly, generous with their possessions, praises and appreciation as well as being satisfied with themselves and their achievement. On the other hand, those with negative self-concept are more likely to feel having a *raw deal,* are sorry for themselves, make disparaging remarks about others, complain and blame others for their mistakes, are selfish and solicit help from others.

Self-concept influences the behaviour of adults in the same way. Thus, childminders and preschool teachers who have favourable self-concept are more likely to perceive children in a more positive light and are warm and encouraging. Conversely, those with negative self-concept are more critical of the children, less generous with their praises and are less satisfied with themselves and the children's behaviour. To inculcate positive self-concept or self-esteem in children, caregivers must themselves possess good self-concept. Abusing parents, more often than not, have problems with their feelings of self-worth. Therefore, parents, childminders and preschool teachers with low self-esteem need assistance in this area of their personality before they can be effective caregivers.

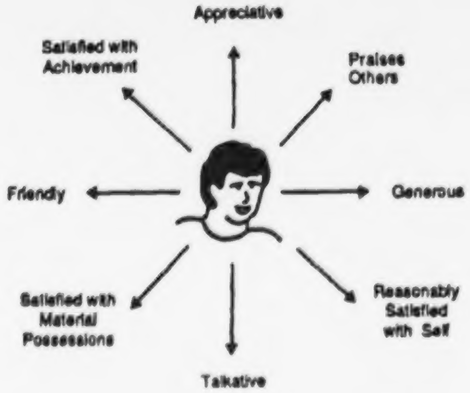
Appreciative
Satisfied with Achievement
Praises Others
Friendly
Generous
Satisfied with Material Possessions
Reasonably Satisfied with Self
Talkative

Figure 1: Child with Positive Self-concept

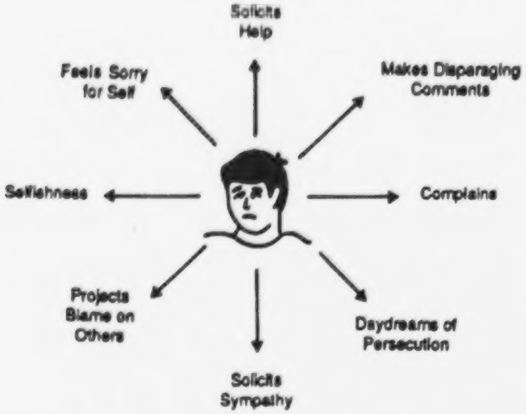
Solicits Help
Feels Sorry for Self
Makes Disparaging Comments
Selfishness
Complains
Projects Blame on Others
Daydreams of Persecution
Solicits Sympathy

Figure 2: Child with Negative Self-concept

b) Prejudice

Our data in Table 4 show that very few of the preschool children are racially aware and choose friends on the basis of race. However, we observed that the majority of the children chose friends of the same race although they were not able to state the reason. Although children may not have the cognitive

Table 4: Racial Awareness by Age and Sector (In Percentage)

Age (Yrs)		All	UA (647)	UD (694)	RU (1139)	ES (368)
3	Racially Aware	2.0	1.5	2.3	3.1	
	Unaware	98.0	98.5	97.7	96.9	100.0
4	Racially Aware	4.8	5.3	1.2	9.8	
	Unaware	95.2	94.7	98.8	90.2	100.0
5	Racially Aware	8.0	7.2	7.3	11.1	1.4
	Unaware	92.0	92.8	92.7	88.9	98.6
6	Racially Aware	13.2	10.7	13.1	14.3	14.3
	Unaware	86.8	89.3	86.9	85.7	85.7

structures to verbalise their thoughts and feelings, they can identify with those of similar race and move towards them.

Prejudices towards people, food or anything for the matter, like other personality traits, are learned through observation and imitation. Preference for or prejudices against any person or object can be expressed verbally or nonverbally through body language. Children are keen observers of the behaviour of their parents and significant others as they want to be like them. Thus, parents and care providers have to be conscious of both their verbal and nonverbal behaviour (including attitudes) if they desire to propogate racial harmony and lessen racial tension. Whether the child has a basic trust or mistrust in others depends upon the people who shape her personality.

c) Impulsivity-reflection

In my paper, *Cognitive Development of Preschool Children,* I have discussed the finding of the Malaysian Child Develpment Project which shows that the more reflective the child the better his cognitive development. This finding supports the findings of several studies (Barrett, 1977; Kagan, 1966; Kagan & Messer, 1975; Kagan et al., 1965) which reveal that children who are impulsive tend to make more mistakes, both in speaking and writing, and attain lower academic achievement than their reflective counterparts. Such findings are expected in view of the fact that impulsive children do not take time to think over their answers. According to Block, Block and Harrington (1974) and Yap and Peters (1985), impulsiveness indicates anxiety, self-doubt and intense fear of failing which are translated into an urge to escape the task quickly by responding as fast as possible. To Kagan (1983), underlying impulsivity-reflection is the degree of persistence and effort.

Impulsivity in children can be modified by encouraging or even insisting that they think before giving the answer. This can be done by saying, for instance, "Let us think about the answer".

The ability to reflect upon one's answer is also important in social interactions. Failure to reflect upon an answer or action can hurt another person and create friction.

Although reflective children perform better academically, extremely long delay in responding can also be indicative of self-doubt and uncertainty in learning. Either extreme of this cognitive style can be maladaptive.

d) Attention Span

Being attentive to a task is fundamental to thinking and learning for attention determines the amount of information perceived and considered in any task or problem. When full attention is given to the task, the child picks maximum stimuli from the environment, especially those which have optimal utility for the task at hand and hence, performance is at its peak efficacy.

Children's ability to attend to a task (or their attention span) is developmental in that it increases with age, as indicated by our findings (Table 5). The older the children, the greater is the number of those who could concentrate at the task at hand until it was completed. Furthermore, the younger children are more distractible than the older ones.

Being able to sit still seems a problem for many children. Since this ability is essential to effective and efficient learning, children have to be trained to concentrate at a task. Much time and patience need to be invested to train restless children to be still.

Behaviour modification technique can be used to increase the child's attention span. The child is first given an activity which interests him. This will initially hold his attention for a very short period of time and is rewarded whenever he demonstrates ability to stay still for a little while. Then reward is withheld until he demonstrates ability to concentrate for a longer period. This method of rewarding and withholding the reward continues until the child is trained to concentrate. With this technique, the child is not forced to sit still but he is rewarded whenever he does so.

Some children suffer from extreme distractibility, known as attention deficit-hyperactivity. This disorder, which leads to social friction, academic failure and low self-esteem and which continues into adolescence and adulthood, is difficult to be treated. Children with this behavioural disorder can be a very disturbing and destructive force in the child care centre. Research into the sources of this disorder has produced inconclusive findings. Marital instability, parental distress, high levels of exposure to lead, environmental pollutants, food additives and excessive dietary intake of sugar are found to contribute to hyperactivity. Stimulant medication to reduce overactivity and improve attention, and stimulant drug therapy to decrease the child's need to engage in task-irrelevant, self-stimulating behaviour do not eliminate hyperactive children's difficulties. Drug treatment is now being supplemented by models of appropriate academic and social behaviours and the use of verbal self-instruction to plan and order task-related activities.

7. Moral Development

According to Piaget and Kohlberg, moral reasoning is linked to children's cognitive structure. Children's understanding of the society and the social structure that regulates moral responsibilities increases with increasing cognitive maturity and social experiences. But, people in the child's environment have a much greater influence on the child's set of values and moral behaviour. Children emulate the behaviours they see in others. Warmth and nurturance are facilitating factors for prosocial behaviour as these traits make children more receptive to the model and, hence, they pay more attention to the model's behaviour. Power and competence are the other influential characteristics of models because children want to acquire these traits to attain status similar to that of the model.

Self-control is important in the arena of moral development because it inhibits behaviours when they are in conflict with a moral cause of action. Self-

Table 5: Percentage of Children Who Attend to the Task to the End by Age and Sector

Age (Yrs)	All	UA (436)	UD (530)	RU (860)	ES (328)
3	25.4	29.6	22.0	26.6	20.5
4	40.8	45.1	39.1	43.1	33.3
5	61.7	71.2	61.5	58.6	59.6
6	69.6	78.8	70.2	66.1	68.6

control can also be defined as resistance to temptation or resistance to transgression. For the child to exercise self-control, he must attain certain level of cognitive development. Firstly, the child cannot resist temptation unless he is aware of having an autonomous and separate identity and understands the consequences of his behaviour. Secondly, it requires memory because the child has to internalise his caregiver's directives and apply to his own behaviour. When a child is able to exercise self-control, gratification can be delayed and long term goals can be formulated.

The first glimmerings of self-control appear as compliance around 12 and 18 months when children show awareness of the caregiver's wishes and expectations and can voluntarily obey adult's commands and requests. When the toddlers can comply, then it is a signal that they are ready to begin learning the rules of social life. At this stage, the adult can also monitor the child's behaviour from a greater distance by giving verbal directive such as "please pick up the biscuit".

The capacity for self-control improved by the third year of life because of the advancement in the child's cognitive abilities. Children at this stage can use a variety of self-instructed strategies for resisting temptations. One of which is by thinking of the attractiveness of the reward and the other is to divert their attention to something else. Children's improved capacity for self-control is when they change from pleasing authority figures to achievement of goals set for themselves.

Studies (Rosenberg, 1979; Toner, Moore & Emmons, 1980) show that adults can also facilitate children's resistance by bolstering their self-image. Once self-control becomes a valued dimension of the child's self-concept, it is sustained not just by children's understanding that it is a sensible thing to do but also by a firm inner resolve that it is what they want and ought to do.

The mode of discipline also affects children's self-control ability. Induction and verbal explanations can enhance behavioural inhibitions in children. Caregivers, who use induction as a mode of discipline, can point out the effect a child's behaviour has on others directly (such as "if you keep on pushing him he will fall down and cry") or indirectly ("Don't scold him. He is only trying to help."). Induction may also include suggestions for making amends ("say you are sorry"). However, this method is more effective with school going than preschool children, probably on account of the greater ability of the older children to comprehend the caregivers' reasoning.

8. Conclusion

For children to be physically and mentally healthy, attention should be given to all aspects of development. The development of one aspect at the expense of the others can hurt the child physically and mentally. Most Malaysian children are pressed to achieve intellectually. However, in most cases, it is not even the intellectual development that is being nurtured. What the child is pressed to achieve is a reservoir of knowledge. Intellectual development is more than just knowledge. The more important basic cognitive skills which are not known to parents and caregivers are often overlooked. The areas which are most neglected are the social, emotional, personality and moral development. As it is impossible for me to discuss all these areas of development, only those qualities which are of uttermost importance to the child's mental health are reviewed.

Self-concept is the most important psychological construct for understanding a person's behaviour. It is the force underlying human behaviour because a person acts either to maintain or enhance it.

Child care centres and kindergartens offer opportunities for interactions with agemates and this experience is essential to social development. As peer rejection in the early years is predictive of later social and personal maladjustment, it is imperative that young children be given the opportunities to develop social skills. As anger, aggression and hostility are incompatible to peer cooperation and popularity, caregivers should reduce aggressive behaviours in preschool children while promoting prosocial characteristics such as altrusim and empathy. Self-control which reduces social friction and enables children to attain long-term goals, is another characteristic to be inculcated in children.

Impulsivity-reflection and attention span are not only important to a child's learning but also to his success in social interactions.

Personality traits and prosocial behaviours are acquired through social learning, that is, through observation and modelling. Parents and caregivers are the preschool children's most important models. Care providers who have training in early childhood education and child development are more effective in providing nurturing care than those who do not receive the training. Hence, to promote psychological development in children, it is essential for childminders and preschool teachers to be professionally equipped. The professionalism accorded will also raise their self-esteem which is so essential to their function as models of behaviour to the children.

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Children in Plantations

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> *Full Many A Gem Of Purest Ray Serene*
> *The Dark Unfathomed Caves Of The Ocean Bear;*
> *Full Many A Flower Is Born To Blush Unseen*
> *And Waste Its Sweetness In The Desert Air*

The above stanza from Thomas Gray's *Elegy Written In A Country Churchyard* is an appropriate description of the fate of plantation workers' children who pass through the creches in the plantations of our country. The plantation industry is more than a century old and is one of the important sectors which laid the foundations for the modern economic development of Malaysia. Today, the plantation industry is still a critical and significant foreign exchange earner and provides employment to approximately 225,000 workers under crops of oil palm, rubber, coconut, cocoa, tea and sugar cane.

Infant and child care services are employer-controlled services on plantations. These services are provided by employers to enable both parents to work for their daily livelihood. As wages are relatively low, it is necessary for both husband and wife to work. To enable both parents to turn up for work, it is necessary for the employers to provide infant and child care services. The services provided by the employers are of a custodial nature and did not stretch beyond the employers' objective of keeping the children out of mischief. The creche is usually staffed by untrained elderly women who look after the children through experience and custodial care practices. Development-oriented child care practices are rare. The children are usually cared between 6.00 am and 3.00 pm on all working days. There is a great deal of emphasis on discipline and the children are oriented to punishment and reward-conduct. Their health is not monitored regularly and early identification of children's handicaps and prophylactic measures are hardly taken. Thus, we see that the existing patterns of infant and child care services do not conform to development-oriented strategies for human resources. The creche is the crucible in which plantation owners and managers crystallise a supply of docile and demotivated young generation of workers, who will respond to the employment opportunities for manual and semi-skilled jobs in the plantation system, which is governed by strict discipline and hierarchy. This colonial philosophy of ensuring a supply of workers, who will replace retired plantation workers and are willing to respond to subsistence wages, has unfortunately continued after Independence, in spite of repeated calls by the National Union of Plantation Workers for improvement in the quality of infant and child care in the creches. This improvement would enable plantation workers' children to compete on an equal opportunity basis in the mainstream of economic and social development in the nation.

The standard of infant and child care services has been, for many years, confined to the Workers' Minimum Standards of Housing Act (1966). This Act has now been repealed and has been replaced by the Workers' Minimum Standards of Housing and Amenities Act (1990). Provisions under the latter Act are an improvement when compared to the former Act. However, the provisions of this Act only cater for children up to the age of four. The improvements in terms of facilities and services within the creches for appropriate child care needs have been provided for. However, compliance with the standards, which are minimum, is not necessarily effective, and cost conscious employers usually cut costs, by reducing the level of quality of services required of them.

Infant and child care needs of plantations can be classified into care for babies, toddlers and play group children and preschool children. The current practice only caters for children up to the age of four and thus, excludes the preschool age group of five and six. At the moment, creches on the estates which cater for children up to the age of four are run as an employer controlled service and the needs for preschool children are fulfilled through kindergartens which are organised and run on an ad hoc basis through the Estate National Union of Plantation Workers Committees and other voluntary organisations with the cooperation of the estate management. The situation with regard to personnel, facilities and monitoring of the programmes and progress of the children is inadequate.

The main issues that need to be addressed with regard to infant and child care for plantation workers are as follows:

a) Policy

The government must ensure that the children of plantation workers receive careful attention and allocation of resources for their human resource development. At the moment, plantations are not formally included in the nation's rural development policies and programmes. There are occasional piece-meal allocations of resources for various programmes which include infant and child care on plantations. The government must formulate policies and programmes exclusively for plantation workers' children which will take into account their peculiar needs and fit in the national policies for human resource development. The existing situation of alienation of plantation workers' children from the mainstream of the national human resource development policies and programmes must be discontinued.

b) Legislations

The existing provisions of infant and child care legislations for plantation workers' children should be upgraded to include children of preschool age with due recognition to the needs of kindergartens on plantations. There are several government agencies responsible for kindergarten education and their activities must be coordinated to avoid duplication and utilise economic and human resources effectively and efficiently.

c) Training of Staff

Infant and child care minders and preschool teachers do not have opportunities to undergo formal training to become skilled and qualified personnel suitable in this field of work. The existing training programmes are conducted on an informal and ad hoc basis by voluntary organisations. This helps to upgrade the skills of the persons concerned. But, it is important for the government to take steps to conduct training in this field on a regular and continuous basis so that people who are interested in infant and child care can look forward to appropriate formal qualifications and career prospects in this field. It is suggested that experts in this field of discipline draw up a curriculum for a Diploma programme suitable for candidates with SPM qualifications to acquire skills in infant and child care. Skilled and qualified personnel will enhance the quality of infant and child care, both in rural and urban areas. The Diploma programme can be conducted through existing institutions of higher learning or teachers' training colleges in our country.

d) Resources

Resources for the implementation of improved infant and child care services for plantation workers must come from government allocations. Employers can contribute to the government through taxes for the required funds for infant and child care programmes on plantations. The government must recognise that the plantation industry contributes millions of Ringgit in taxes to the government coffers and it is not too much to ask for an allocation for infant and child care programmes for plantation workers' children.

e) Implementation, Monitoring and Evaluation

The formulation of policies implementation, monitoring and evaluation of infant and child care programmes on plantations must be carried out on a tripartite basis. There should also be effective parent participation in this process. The monitoring of the children's programmes must take into account the health and child development especially with regard to their skills, motivation and social behaviour. All programmes must be evaluated periodically by independent professionals to ensure that the children are being cared for properly and effectively.

Malaysia's development in the context of Vision 2020 hinges on quality human resources. Children from the plantation sector are important for the nation's development. It is vital that they be brought into the mainstream through appropriate programmes in human resources development, the foundations of which are laid in the infant and child care centres on plantations.

Maternal Employment and Child Care

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1. Introduction

The roles of women are multi-faceted. Traditionally, women have played an important role in family development and family welfare although female headed households constitute less than 20% of the households. Recognizing the significant role mothers play towards moulding the future generation of progressive citizens, the Sixth Malaysia Plan stresses the need to equip them with sufficient resources and skills through family life education and upgrading of parenting skills.

Consequent upon economic development, more and more women have entered the labour market. Female labour force participation rate has increased from 37% in 1970 to 47% in 1990 (Sixth Malaysia Plan, p. 414). Moreover, there has also been a significant shift in their employment status from the traditional informal sector to the modern formal sector, where it is more difficult to combine work with child care. Problems of child care among working women are further aggravated with the breakdown of the extended family system, as 7 out of 10 families are of the nuclear type (1984 Malaysian Population and Family Survey).

2. Maternal Employment

Data from the 1988 Malaysian Family Life Survey (MFLS) showed 54% of the married women aged 15-49 were currently working at the time of the survey. About 1 in 3 married women were engaged as employees, and 1 in 5 were either own account workers or unpaid family workers (Table 1).

More and more women are now engaged in the modern sector of the economy. According to the Sixth Malaysia Plan, the proportion of women who are engaged in agriculture declined from 67.9% in 1970 to 28.2% in 1990, while there has been a sharp corresponding increase in the manufacturing and tertiary sectors (Table 2).

Female labour force participation generally increases with age. In the early stage of family formation, some women do withdraw from the labour market, but reenter when the youngest child reaches certain age. The higher labour force participation rate among older women, particularly the Malays, suggests the ease of reentry in the rural agricultural and informal sector.

Table 1: Percentage of Married Women Aged 15-49 by Employment Status, 1988

Currently working		**54.1**
as Paid Employee	(33.3)	
as Own Account Worker	(10.8)	
as Employer	(0.6)	
as Unpaid Family Worker	(9.4)	

Source: 1988 Malaysian Family Life Survey

Table 2: Employment Distribution (%) of Working Women by Industry, 1970-1990

Industry	1970	1980	1990
Agriculture and Forestry	67.9	49.3	28.2
Mining and Quarrying	0.7	0.3	0.2
Manufacturing	8.1	16.3	24.3
Electricity, Gas and Water	0.1	0.1	0.1
Construction	0.5	1.0	0.7
Wholesale and Retail Trade, Hotels & Restaurants	5.8	11.2	19.7
Transport Storage & Communication	0.5	0.7	1.5
Finance, Insurance, Real Estate & Business Services	-	1.6	3.9
Community, Social & Personal Services	16.4	19.5	21.4
Total	100.0	100.0	100.0

Source: Sixth Malaysia Plan, p. 417

Having young children may pose a constraint to labour force participation among married women, but data show that work rate increases over time even among women with young children (Table 3). In 1968, the proportion of these women who were working was 35%. By 1988, almost half of women with young children were in the labour force. While many Malaysian women may find ways to combine work with child care, nearly 23% of working women had to stop work due to child care reasons (Table 4), that is, as many as 1 in 4 professional women have to quit their jobs to look after children.

Table 3: Work Rates Among Married Women Aged 15-49 Years (by Age of Youngest Child) by Selected Years

Age of Youngest Child	1968	1978	1988
< 6 months	35%	36%	49%
7-12 months	43%	43%	47%
13-24 months	36%	44%	52%
25-48 months	47%	48%	60%
5-12 years	46%	47%	68%

Source: 1988 Malaysian Family Life Survey

Table 4: Percentage of Women Who Stopped Working Due to Child Care Reasons

Occupation	Percentage
Professional, technical & administrative	25.0
Clerical	25.0
Sales	18.9
Services	15.5
Agriculture	30.4
Production & transportation	21.0
All	22.9

Source: 1988 Malaysian Family Life Survey

3. Child Care Arrangement

With increased participation in the labour force, there is a tendency for women to spend less time with their children, and this may affect the upbringing and development of children. According to the 1988 MFLS, about

70% of the women aged 15-49 years had children under 6 years of age. There is, therefore, a need to provide proper child care facilities to cater for the need of working women.

Table 5 shows that family members, including parents, older children and husband, are the main source of child care help. The professionals, managers and clerks are more likely to depend on other sources of help, probably because they can afford to pay for such services more than the rest. Child care centres are rarely used by both working and non-working women. Is this due to unavailability of such services? It is also worth noting that almost 42% of sales workers have received no help in child care.

Table 5: Child Care Arrangement Among Working Women

Occupation	Child Care Arrangement (%)			
	Family Members	Someone Else	No Help	Total
Professional, technical & administrative	32.9	61.4	5.7	100
Clerical	42.1	55.3	2.6	100
Sales	43.8	14.6	41.6	100
Services	48.9	28.6	22.5	100
Agriculture	51.9	28.1	20.0	100
Production & transportation	53.9	20.6	25.5	100
All	47.0	32.4	20.6	100

Source: 1988 Malaysian Family Life Survey

4. Maternal Role in Child Care and Child Development

The dominant role of women in household chores is well known. Women are primarily responsible for the supervision and upbringing of children, and this is borne out by the findings from an indepth study of four rural communities conducted in 1991, as shown in Table 6.

Table 6: Main Person Responsible for Child Care and Child Development

Activities	Percentage
Baby sitting	
Husband	2.2
Wife	80.0
Others	17.8
Taking care of young children	
Husband	6.0
Wife	63.2
Others	30.8
Supervision of children's daily activities	
Husband	8.2
Wife	36.8
Both	49.4
Others	4.6
Supervision of children's school work	
Husband	17.5
Wife	21.3
Both	61.2
Total	100.0

Source: Tey Nai Peng, (1991). Roles and participation of Malaysian women in household decision-making. Paper presented to the seminar on "*Status and Role of Malaysian Women and Family Welfare*", University of Malaya (FEA).

5. Conclusion

The percentage of women in the labour force has increased over the years, with more of them in formal occupations. Although some mothers stopped work to look after their children, there were many who continued to work after having children. While the majority of the children whose mothers are in the professional, technical, administrative and clerical occupations were cared by someone else, the majority of the children in the agricultural sector were looked after by family members. However, 41.6% of the children in sales, 22.5% in services, 20.0% in agriculture and 25.5% in transport and product had no one to look after them. Children without proper adult care are vulnerable to physical hazards and peer influence, and at the same time, suffer developmentally from lack of care and attention. This state of affairs requires urgent attention. One of the strategies to provide proper adult care and supervision is to have day care facilities available to parents. Husbands and families who share in the household chores will relieve working mothers of the double burden of career and housecare.

Physical Environment and Child Development

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1. The Physical Environment

It has been universally agreed that all of us have a responsibility to our children and to the physical environment.

The concept of environmentally sound and sustainable development is the centrepiece of the final report of the World Commission on Environment and Development, *Our Common Future*. This concept essentially addresses the question of actions that will meet the needs of the present generation as well as not jeopardizing the prospects of survival for future generations. Indeed, this new concern - our responsibility to protect the earth we bequeath to our children - is overshadowing all others.

It should be borne in mind that rapid population growth has a bearing on the issue of intergenerational equity. This generation not only has the responsibility to preserve natural resources but also has the responsibility not to create huge future populations which the present levels of resources could not support, even if they could be sustained. In this connection, following the momentus World Summit for Children, UNICEF called for a movement for children to be allied with movements both for environmental protection and reduction of population growth.

A good physical environment, which enables a quality of life to be attained, has some more easily measurable indicators. For the child, a good physical environment includes the following:-

- Living arrangements
- Housing
- Health care and disease control
- Nutrition
- Education
- Child care facilities

What all this means is that both the family and the community should provide a physical environment necessary for the development of the child.

The child is vulnerable, dependent and innocent. No one, especially parents, should be allowed to walk away from the responsibilities of caring for their young.

In some cases, poverty is the main enemy, not an excuse. Differences in homes, clothing and food obviously affect children's development. Death cuts down 170 children under five years of age per thousand in South Asia whereas in Sweden it is only 10 to a thousand.

In Malaysia today, we are fortunate that we do not have casualties of war and violence, apartheid and foreign occupation; refugees and epidemics affect children most. In spite of the relatively favourable environment, we should enhance the physical environment further so that our children are given the opportunity to maximize their potentials in a safe and supportive environment through families and other caregivers committed to their welfare. Under such conditions, children are more prepared for a responsible life in a free society and for their future.

There are some action areas which the family and the community can take to provide the physical environment for children's development. A universal concept has already been endorsed that *early child development is the process of physical and psycho-social maturation that occurs during the period of birth to five or six years of age*. Therefore, this period is the critical stage in the formation of intelligence, personality and social behaviour.

From a UNESCO worldwide survey of 670 institutions from 116 countries worldwide involved in early childhood development, the conclusions emphasize three main areas of action in their programmes:

- The Young Child
- The Family
- The Community *(See Appendix I)*

To meet the needs of young children and to create the physical environment, these actions need to be integrated to involve children, parents, families and communities.

Governments and institutions should underscore strategies that would enable:

- a gradual improvement in the quality of life of all members of the community, the child, the parents and the family;
- an improvement of the ability of individuals, families and communities to solve their problems by using locally available resources and identifying external factors which can contribute to their solutions;
- preparation of children, parents and families to become active participants in the process of community development.

Thus, all these three aspects need to be included in all programmes, and built into processes for child development to support and adhere to the concept of inter-generational equity.

2. Actions Concerning The Family

The physical environment has deteriorated even in developed countries, making it unsuitable for childrearing for individual families. In Taiwan, for example,

> despite having enjoyed an *economic miracle* brought about by a 30 year joint effort of the government and the private sector, Taiwan has become a place unsuitable for its citizens to live in. It has exhausted many of its natural resources due to negligible pollution prevention. Non-governmental groups have begun to advocate the notion that environmental rights are basic human rights, and human beings should learn to live harmoniously with nature, rather than destroy their lifeline. They also strongly emphasize that we need to make sure we leave a habitable earth for future generations (Lih, 1991).

(i) Family Stucture

Family structure shapes children's homes and learning environments in numerous ways. In a survey of twenty countries, it was found that about three-quarters of all households have both parents present and one-quarter of the households have only one parent present, headed by mothers. Single parenthood increases the responsibility of the one parent to feed, shelter and educate children, often without the necessary support and collaboration of another adult. Time spent with children under these conditions may be reduced due to competing domestic responsibilities, employment outside the home, and problems in meeting the needs of more than one child.

Economic and child care, constraints of single parenthood, are believed to have an adverse effect on the learning achievements of young children in numerous ways, such as, frequent ill-health, persistent malnutrition, lack of early stimulation and lack of basic learning skills.

The 1990 Economic and Social Survey of ESCAP reported that poverty worsened along gender and age lines. Women are hemmed in by all manners of cultural, social, legal and economic obstacles that men - even poor men - do not have to contend with:

> "The feminization of poverty. . . shows female-managed households are among the poorest income strata. . . . Seventy percent of the world's poverty stricken population consists of women. . . . In Asia, families managed by widowed, divorced, abandoned or single women constitute 16 to 20% of all households."

What does all this mean? In such a physical environment of living arrangement, child rearing is not at its optimum condition. A young child has the right to expect both his mother and father to help him in his early development. With women's participation in the labour force, the issue of child neglect is very real. I have seen in the field, very young children left with the responsibility of caring for younger siblings while their mothers are at work. There are no child care facilities arranged to care for young children amongst women working in agricultural sectors, and these families are poor.

In a FAO study of 1978, the percentage of landlessness of the total rural population was over 70% in Malaysia. Agriculture remains the main source of income for many. The young children of these households are left alone when the women work in the fields.

On childrearing and women working, the Second Malaysia Family Life Survey 1991, showed that half of the women labour force work even though they have young children. But, more of these women are found in the formal sectors, that is, in the professional, technical and clerical, with a decline in the agricultural sectors. This could be due to the availability of child care providers for those who can afford it.

(ii) Education

The Second Malaysia Family Life Survey, carried out in 1991 by The National Population and Family Development Board (LPPKN) and the Rand Organisation, investigated the expenses for children's education. The findings are as follows:

a) Urban parents aged 25-27 spend more than rural parents.

b) There is little gender difference, that is, there is no discrimination against the girl-child.

c) Educated parents spend more than uneducated parents.

d) Children of single parents face difficulty in furthering their studies.

The family's impact on young children's development cannot be over emphasized.

(iii) Food

An environment with adequate food supplies benefits children most.

> It was the combination of irrigation and fertilizers that led to the increase in production of high-yield crops some years ago, but this production is levelling off. The shortages of grain supply which we are now seeing, and which will increase, led to higher prices. Between July 1987 and July 1988, world grain prices shot up by 50% and have not come down. The net result of all this is starvation in many parts of the world, particularly hitting small children. In this connection, it may be noted that nearly 40% of the world's total grain is fed to livestock, mainly to supply the enormous demand for meat and other livestock products in the richer nations (Durning, 1991).

3. Actions Concerning The Community

The infrastructure available to the community is an indication of whether or not the physical environment is conducive to the bringing up of a young child (see Appendix II). It is generally accepted that the gross national product (GNP) indicates the country's support available. However, we know that, even in some advanced nations, housing and the environment are not conducive to the child's upbringing. Environmental degradation and overcrowding in urban conditions are problems which require urgent interventions.

Health services, conducive schools, houses, playground are all basic necessities for child development. Even the noise around a school environment affects children. In Hong Kong, for example, when planes fly into Kai Tak Airport, the feeling of being plunged into a city is felt. Yet, there is a school right in the path of the air landing. The school has taken measures to put double-glazed glass and to monitor the sound of the planes. Some aircrafts, like those of the Cathay Pacific Airlines, are able to land more quietly than others.

The community itself can plan and implement self-help programmes in areas that affect them most. Community organisations are in the best position to mobilise their own local resources for action in activities that require urgent attention.

Community development and programmes succeed best when self-participated. Self-help and *gotong-royong* have beautified villages and made them clean. Through self-help, the community has also succeeded in organising child care activities for working parents. Health campaigns are successful when the demand comes from the community and diseases are stamped out and controlled when the whole community wants to do it.

The community is the best mobiliser of social and community resources. It benefits most when the technology is environmental friendly. Therefore, the community plays a major role in the protection and preservation of the environment for generations of children to come.

Still more action is needed to prevent the degradation of the environment both in underutilised and developing countries, and to meet the survival and development needs of the poor. On the other side of the coin, the wasteful consumption of the affluent and their children are damaging to the resources of the physical environment and to child development.

An Ambassador from India to the United Nations said, "the birth of an American baby is a greater disaster for the world than that of 25 Indian babies". However, we should be quick to add that even in America there are ghettos.

Therefore, the conservation of resources and the values we teach our children all have far-reaching implications for our future. Much more is required to increase actions which are more proactive in favour of child and family programmes.

Educational programmes to inculcate respect for the natural environment and for sustainable development are essential for parents and children. Some countries have already begun the education. In Korea, the Ministry of Education is developing new curricular and teaching materials for primary and secondary schools to provide children with the basic environmental knowledge. The Ministry also sponsors environmental campaign and organizes speech and writing contests on environmental protection.

In Malaysia, several environmental societies also provide environmental education to children. For example, the Malayan Nature Society publishes and reprints books on nature history, organizes one day field trips to places of nature history, offers longer trips to places like the National Park, islands and mountains, hosts field courses for children and adults, arranges seminars and symposia from time to time, participates in nature oriented exhibitions and initiates scientific research and discovery projects. The Environmental Protection Society of Malaysia publishes books to increase environmental awareness.

In Taiwan, nongovernmental organizations have initiated many types of educational programmes designed for a wide range of audience, including school children, school teachers, mothers and grandmothers. The main purpose of the programme is to make people aware of the need for environmental protection.

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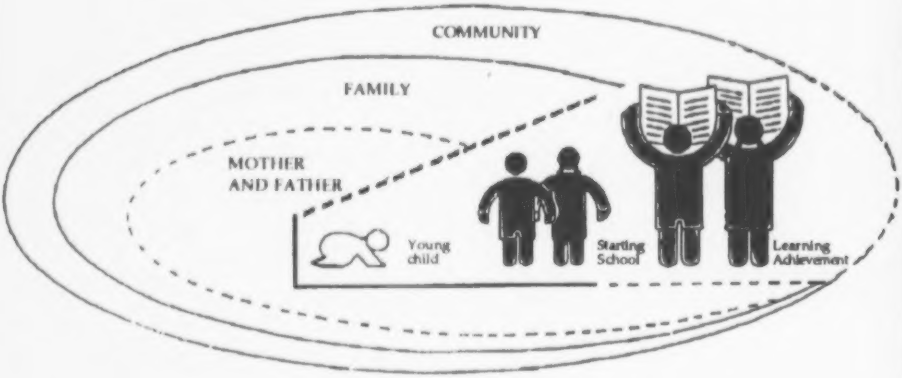
Appendix I

PHYSICAL ENVIRONMENT AND CHILD DEVELOPMENT


COMMUNITY
FAMILY
MOTHER AND FATHER
Young child
Starting School
Learning Achievement

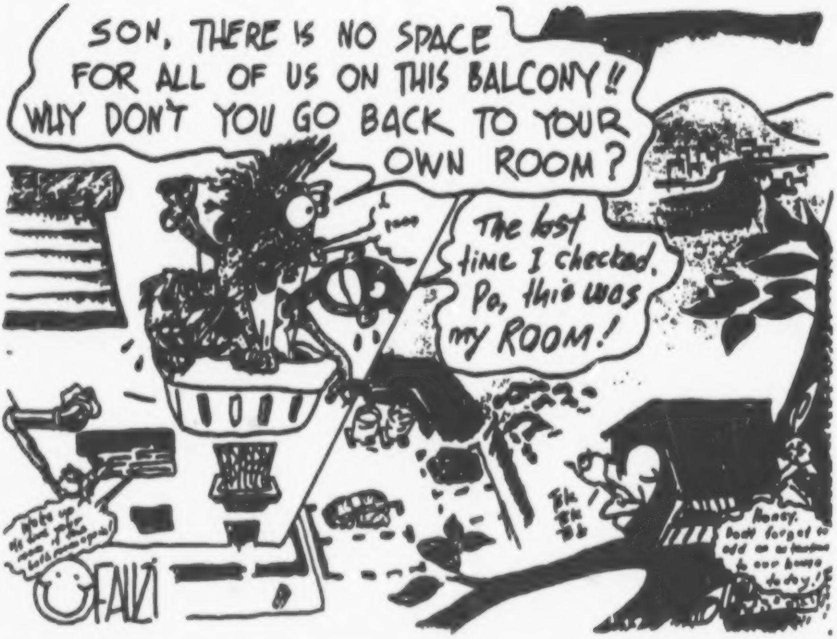
Young child
- i. Nutrition
- ii. Health-care
- iii. Preschool

Mother and father
- i. Family planning
- ii. Preparation for parenthood
- iii. Health-care

Family
- i. Living arrangements
- ii. Childrearing
- iii. Mother and infants
- iv. Education

Community
- i. Environment
- ii. Housing
- iii. Development
- iv. Children's right and protection
- v. Infrastructure

Appendix II


SON, THERE IS NO SPACE FOR ALL OF US ON THIS BALCONY!! WHY DON'T YOU GO BACK TO YOUR OWN ROOM?
The last time I checked, Pa, this was my ROOM!
Honey. Don't forget to add on an [illegible] to our house today!
FAUZI

(with courtesy of NST)

Psychological Environment and Child Development

Chlam Heng Keng
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Child development refers to the sequential changes which a child goes through on the way to becoming an adult. These changes take place from the very moment when the sperm penetrates the egg and their nuclei fuse to form the zygote. Principally, there are four areas of growth:

> **Physical growth** has to do with development of the body and its parts.
>
> **Motor growth** refers to the development of skill in the use of the body and its parts.
>
> **Cognitive growth** involves the mind and how it works.
>
> **Affective growth** centres on the self-concept and the development of social, emotional and personality characteristics.

The main objective of child development is to enable the child to become a physically healthy, well-adjusted adult who contributes to the well-being of others and the community and to the progress of the nation. To attain this objective, parents, care providers and teachers have to give attention to all the four aspects of development, not just one or two aspects because the aspects are all interrelated. To ignore one area of the child's development can adversely hinder the optimal development of the other areas.

To most psychologists, development is the product of nature and nurture. In other words, development is an interaction between genetic and environmental factors. The genetic makeup of the individual or what the individual inherits determines the potential capacity (genotype) while environment determines the extent to which the potentials develop (phenotype).

While the child's potential capacity cannot be changed, the environment can be manipulated to bring to fruition the optimal development of the child. There are principally two types of environment - physical and psychological. People have become increasingly cognisant of the effect the physical environment has on the child's development. For instance, seizures, irritability, lack of coordination, clumsiness, hyperactivity, change in behaviour and mental retardation occur when blood lead concentration is in the range of 400-500 microgrammes/litre. But, the impact of the psychological environment is much greater. Broadly, the influence of the psychological environment can be examined from three perspectives, namely, provision of materials, the family and care providers.

1. Provision of Materials

It is generally accepted that a stimulating environment is vital to children's development. A stimulating environment is popularly taken to mean availability of books, educational games and toys and exposure to a wide range of experiences which may include verbal interchange. But educational materials feature prominently as the essential item. These materials, more often than not, are perceived as those produced commerically. Consequently, when parents scout for a preschool for their children, one of the important criteria employed for grading the preschool is the availability of materials and equipment. Maria, the mother whose four children are geniuses in different fields, found complex adult-inspired apparatus and toys to restrict her children's growth. According to her, the materials were designed not for specific purposes or children's specific requirements but were designed merely to divert the child and kill time as the materials were designed by people who were not directly concerned with the result of the individual parent-child relationship. To Maria, it was the simple things, such as pens, paper, rafia and home materials, which provide endless hours of exploration and imagination for her and her children (Deakin, 1972). In spite of the fact her children are exceptionally endowed and her experiences may not be applicable to all and sundry, there is a great deal of truth in her observations. Keen observations will reveal that many of the toys and educational materials are not as beneficial as purported. For instance, most children are fascinated by lego which can keep them quiet for hours but the product of their efforts is not understanding in creativity or imagination. If you watch children at play, you will notice that children pick up the pieces randomly and stick them into wherever they can be accommodated. Very few of them produce masterpieces and few of them are stimulated to think by lego. On the other hand, cardboard boxes, coconut leaves, cans and "mud" demand creativity, imagination and resourcefulness.

It is not the presence or absence of materials that promotes or hampers children's development. It is how the materials are being utilised. Every environment is rich in stimuli and it depends on the resourcefulness of the caregiver to utilise them to stimulate children's growth. The classroom is more impoverished in stimuli than the natural environment. It is this deprivation that necessitates the provision of toys, equipment and instructional materials. It is not uncommon for nature to be brought into the classroom to give children the necessary experiences and reality. It is true that books, like the Ladybird Series, have great attraction for many children and can create in them the love for reading. Newspaper and magazines, serving as a very copious source of children's (even preschool children) knowledge, can also perform similar functions. A mother attributed her daughter's love for reading to seeing her reading the newspaper daily and her daughter's curiosity as well as the desire to know what she was reading. Her daughter's insistence to know what the word was and its meaning resulted in extensive vocabulary acquisition. Junk materials (such as sweet wrappers, corks, caps, paper cups, scraps of paper and cloth, ice-cream sticks, dried leaves, twigs and cartons) are another source of priceless treasure. Its creative utilisation can give children hours of pleasure besides promoting motor development, creative thinking and cooperation. Their creation can serve as materials for language development by narrating what they have done. When used in this manner, the motivation to learn is heightened on account of the pride children have in their handiwork. Displaying the child's work gives him feelings of self-worth.

In short, materials to stimulate children's mental development do not need to be expensive nor have they to be complex and designed by adults. Every environment of the child is rich. What is required is the caregiver's attitudes and creativity. Undoubtedly, it is much easier to utilise educational materials, toys and equipment that have been prepared by someone else. But will such materials be as effective for the child's total development as materials in the child's environment since the designers have no knowledge of the specific needs of the child?

2. The Family

The family is the child's earliest and most sustained source of the child's socialisation which is the process by which the child's standard, values, skills, motives, attitudes and behaviour are shaped to conform to those which are approved by the society of which the child is a part. In the earliest years, parents, especially the mother, play the most significant role in moulding the child's behaviour. While in the mother's womb, the attitudes of the family, especially of the mother, have already made a deterministic impact on the child's development and behaviour. The foetal environment as well as the environment which surrounds the child at birth and after birth of a wanted child differs immensely from that of an unwanted child - physically and psychologically. The mother of a wanted child takes proper care of herself to ensure proper care of the child she is carrying. Her happy mental state influences her psychological and physical well-being which, in turn, will affect the foetus' well-being. The child can be born into an atmosphere of love and care or one of indifference or even rejection. The treatment that these two children receive is likely to be as dissimilar as night and day. Consequently, while one learns to trust others, the other learns to mistrust. While one has positive self-concept, the other is imbued with feelings of low self-esteem, rejection and worthlessness. These two children with such wide variations in their basic foundations will react differently to the environment, thus widening further the gap in cognitive and socioemotional development. Severe maternal deprivation can produce failure to thrive (that is, the child fails to grow or even waste away) or deprivation dwarfism (Gardner, 1972).

The mother's smiles will evoke the child to respond and when she speaks and plays with the child, he responds by cooing, thus facilitating language development. This mother-child interaction also conveys to the child his mother's love, producing in the child feelings of belonging and self-esteem. Studies of Crockenberg (1983) and Elardo, Bradley & Caldwell (1977) show that verbal and maternal responsivity are related to the child's mental development. The mother-child interaction also strengthens the child's attachment bond which, if failed to be established within the first two years, impairs cognitive and socioemotional development (Matas, Arend & Scroufe, 1978; Scroufe, Fox & Pancake, 1983).

Parenting style also influences the child's development (Baumrind, 1967). Authoritarian parents have children who are conflict-ridden, unhappy, and neurotic. These parents are usually rigid, harsh, power-assertive and unresponsive to their children's needs. As a result, the children feel trapped and resentful but are afraid to assert themselves. These children are also low in academic and social competence. Permissive parents are affectionate but are extremely lax and inconsistent in their discipline; such parents have children who are impulsive and lacking in self-control. Children of authoritative parents are friendly, energetic, adaptive, competent and self-controlled. The characteristics acquired during childhood are carried through adolescence into adulthood.

The fourth group of parents are those who are detached, parent-centred rather than child-centred and are motivated to do whatever is necessary with minimum effort. The child is kept at a distance. With older children, the parents have little desire to know where the child is, what the child is doing and who are the child's companions. In other words, parents fail to monitor the child's activities. Infants of such parents are insecure in attachment (Egeland & Scroufe, 1981) while the older children tend to be impulsive, aggressive, noncompliant and moody as well as have low self-esteem (Loeb, Horst & Horton, 1980; Martin, 1981). Adolescent and young adults from such homes usually are truants, spend more time on the street, have drinking problem, low cognitive development and poor academic performance (Pulkkinen, 1982).

Parental conflict is related to aggressive and delinquent behaviours in children and unpopularity in peers (Emery, 1982; Hetherington et al., 1982). According to Rutter (1977), it is the discord before the breakdown rather than the breakup itself which is related to the child's delinquent behaviour. Boys are more susceptible to the negative effects of family disharmony than are girls (Hetherington, 1982; Rutter, 1977).

3. Care Providers

Care providers refer to all those who provide care substitute. They, therefore, include childminders and teachers in day care centre, nursery and kindergarten. The main purposes of placing children in day care centres, nurseries and kindergartens are to provide supervision for the child while parents are at work and for the child's intellectual development. Increasingly, parents are relying on the care providers for intellectual stimulation as most parents, especially working parents, have neither the time nor the energy to carry out this function. Hence, selection of the day care centre or kindergarten is based primarily on its curricular offerings, with little attention to the personality and attitudes of the caregivers. However, Ruopp et al. (1979) reported that caregivers who had training in early childhood education and child development give better nurturance. Children under trained caregivers score higher on intelligence tests than those cared by untrained ones. It was found that those with training were competent in providing verbal stimulation, were more responsive to the child's needs and give better guidance than the untrained ones.

Investigations into the effects of alternative child care on children's behaviour disclose contradictory results. Researchers such as Barglow et al. (1987), Belsky and Rovine (1988), Chase-Lansdale and Owen (1987) found higher incidence of insecure attachment in infants of working parents while other researchers, such as Owen et al. (1984) and Easterbrooks and Goldberg (1985), obtained no differences in attachment between infants cared by mothers and those with substitute care. This difference in the research findings could be due to the quality of substitute care. The study of Vaughn, Grove and Egeland (1980) showed that infants from low income families who were looked after by insensitive, barren and unstable care providers were more likely to develop avoidant attachments. Highly positive maternal relationships failed to buffer the child against such care. These children are likely to display less competence and more maladaptive behaviours in later years.

Although studies on the effect of day care on preschool children show positive outcome in children's cognitive, language and social skills, not all day care centres produce similar level of development. For all aspects of the child's psychological development to advance and function properly, care should be of high quality. This implies that the group size is small, caregiver-child ratios are low, staff training is good and adults communicate in stimulating, responsive and affectionate ways. Care providers have to be knowledgeable to be able to mount appropriate programmes and provide their charges with relevant experiences. The number of children should not be too many to ensure the care providers' resources are not overextended. Like parents, care providers have to be authoritative, not authoritarian or permissive, so that they can respond to the child's needs and carry out discipline to enable children to take on responsibilities without feeling restrictive. As a result, child development is fostered. Although every child can benefit from quality day care, low income children particularly have much more to gain intellectually from enriched day care experiences.

Conclusion

Every child is endowed with potentials (genotype) athough they differ in degree and types. For the potentials to be expressed or manifested (phenotype), children must be exposed to appropriate environments. The natural or physical environment of every individual is overflowing with stimuli. What is most important is the ability of parents and care providers to tap and utilise the resources in the environment. While ready-made materials and equipment can supply experiences to children, the mere existence of these materials or ineffective utilisation will not contribute much to child development. Whether they are resources in the natural environment or expensive materials, they are of little use unless parents and care providers know how to utilise them to promote the child's specific needs. Psychological environment that fosters child development rests mainly upon the knowledge, sensitivity, responsiveness of parents and care providers. If they have these qualities, authoritative caregiving will automatically follows. However, the number of children is important because if they are overstretched they cannot function optimally.

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Ecology of Young Child Nutrition in Malaysia

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1. Malaysia - Its Geographical, Socio-Cultural and Economic Background

Malaysia, which is situated near the equator between latitudes one and seven degrees north and longitudes 100 to 119 degrees east, covers an area of 329,293 square kilometres. Its climate is equatorial, with a temperature of 30 degrees celsius during the day and tropical showers throughout the year. Verdant green forests, huge rubber and oil palm plantations, interspaced by tin mines and padi fields are typical throughout the country. Malaysia comprises three main regions: Peninsular Malaysia, Sabah and Sarawak.

Malaysia is a plural society with a population of 16 million, made up of Malays and aborigines (54%), Chinese (35%), Indians (10%). A small minority, mainly of Portugese, Dutch and English descent, forms the remaining 1% of the population.

The economy of Malaysia, a rapid developing country, has remained bouyant and strong in spite of inflationary trends, owing to its earnings from exports of natural rubber, tin and, in more recent years, palm oil and crude petroleum. Its Gross National Product has remained strong since independence and in 1989 it expanded by 10.9%. For the same year, its annual per capita income rose to RM5,477 (Economic Report, Ministry of Finance, 1989).

2. Overview of Country Nutritional Status

In the years following independence in 1957, several clinical and dietary surveys undertaken by various research groups brought into focus the existence of mild to moderate protein-energy malnutrition and anaemia among the young and school going children in the country (IMR, 1957; ICNND, 1964; Thompson, 1965; Kim & Chee, 1968).

In the last two decades, indepth community nutrition studies covering clinical, biochemical, dietary and anthropometric aspects carried out by several groups in various parts of Peninsular Malaysia, Sabah and Sarawak, reported varying prevalences of undernutrition among the vulnerable groups of the population (Brearley, 1970; Kandiah, Lee, Ng & Chong, 1984; Chong, Tee, Ng & Kandiah, 1984).

Several indirect indicators of health have been used to define the status of nutrition at the population or national level (Jelliffe, 1966). Among those more commonly used are: infant and toddler mortality rates, the availability of food supplies and consumption at the per capita level.

a) Infant and Toddler Mortality Rates

The infant mortality rate has generally been regarded as an index of the social, economic and most importantly, community health status (Newland, 1982). A study by the Pan American Health Organisation (PAHO, 1971) in ten countries has provided evidences of an association between malnutrition and mortality of preschool children. Wray (1975) showed that as the nutritional status of a community improved, infant and toddler mortality rates declined.

In Malaysia, infant and toddler mortality rates have thus been used as indirect indicators of the overall nutrition situation in the country. Table 1 shows some of these indicators in Malaysia, in relation to several countries in the ASEAN region as well as the more developed nations, such as Japan and Korea (Tee & Khor, 1986). Data presented show a general trend in the improvement of health and nutritional status from 1960 to 1982 in each country which is associated with improvement in socioeconomic conditions, as seen by the increasing gross national product (GNP) of these countries.

While these indices give an indication of the overall nutritional status of the country or state, they do not, however, show the problems existing at the micro level. In Malaysia, while the overall nutrition situation has generally improved over the years, recent studies have indicated the existence of pockets of malnutrition in various parts of the country.

b) Food Availability

The Food Balance Sheet is a useful management tool developed for disclosing trends in national food supply and estimating the availability for food items, which can be translated into calories and other nutrients on a daily per capita basis.

Table 1: Economic and Health Status of Selected Countries, 1960-1982

Country	Per capita GNP (US$)	Life expectancy at birth		Mortality rates per 1,000 Infants (<1 yr)		Mortality rates per 1,000 Toddlers (1-4 yrs)	
	1982	1960	1982	1960	1982	1960	1982
Indonesia	582	41	52	150	90	23	13
Thailand	790	49	63	100	50	13	4
Philippines	820	53	64	110	50	14	4
Malaysia	1860	54	67	70	29	8	2
Rep. of Korea	1910	54	67	80	30	9	2
Singapore	5910	65	72	36	11	2	<1
Japan	10080	68	76	31	7	2	<1
Australia	11140	71	74	20	10	1	<1

Source: E. S. Tee & G. L. Khor (1986)

Table 2 gives some data extracted from food balance sheets for Malaysia taken from reports of the Food and Agricultural Organization (Qureshi, 1986). During the past two decades (1961-1984), Malaysia has experienced an increasing trend ranging from 8.4% to 12.1% in the availability of total calories.

Although Malaysia traditionally derives its bulk of the calories from cereals, mainly rice, there has been a downward trend in the contribution of cereals to the total available calories. A decrease of 4.6% in availability of calories from rice was noted for Malaysia for the year 1986 (Qureshi, 1986). Aside from cereals, oils and fats, roots and tubers form the other major sources of calories for Malaysians.

Protein supply has increased steadily since 1961. The total protein available in grams per capita per day rose from 49.5g during 1961-70 to 56.0g during 1979-81, registering an increase of 20.3%. The same period saw a concomittant decline in the supply of protein from plant sources, notably cereals, pulses and nuts, to more animal protein sources such as fish, meat, milk and eggs.

Table 2: Energy, Protein and Fat Availability in Malaysia

	1960-70*	1971-78*	1979-81#
Daily per capita supply of:			
Energy (kcals)	2415	2552	2518
Protein (g)	49.5	51.5	56.0
Fat (g)	44.3	46.9	51.6
% animal proteins	31.3	35.0	44.5

* Qureshi (1986) for Peninsular Malaysia only
# Peninsular Malaysia, Sabah and Sarawak

The years between 1961 and 1984 also saw a rising trend in the availability of fat. Per capita supply of fat rose from about 44.3g to 51.6g during this period. The principal source of visible fat in the Malaysian diet is palm oil which provides 53% of the total available calories (Ng, 1989).

c) Food Consumption

While food balance sheets describe average food supplies at the national level, diet surveys provide information on the actual consumption of food at the community and household level.

In Malaysia, most of the information available on the dietary intake of population groups has been the result of sporadic surveys undertaken by the Institute for Medical Research and other organisations. No nationwide representative data on food and nutrient consumption are available for Malaysia.

The study by Zanariah & Jaafar (1983) showed rural intake of calories to be 22% below the availability as given in the Food Balance Sheet while the urban areas had 15% less. Chong et al. (1984) found that 66% of rural households studied were not able to meet their requirement for calories. Similarly, Chen (1983), in his study on native communities of Sabah, found that some 75% of households had a median calorie below the recommended daily allowances.

With respect to protein intake, dietary surveys have found its level close to or higher than the national availability figures for Malaysia. Malaysian urban households have been reported to be consuming more protein, derived mainly from animal sources, than their rural counterparts. Thirty-four percent of the households had consumption levels below the recommended dietary allowances (Zanariah et al., 1983).

With increasing importance being given to the type and quantity of fat in the diet and its implications in the etiology of certain diseases, it is of interest to note from food consumption studies that both urban and rural households in Malaysia did not consume as much fat when compared to available data provided by food balance sheets (Chong et al., 1984).

Household food consumption studies give a general impression of per capita intake of nutrients but they do not reveal the distribution of food within families. Hence, the adequacy of consumption by individual members is not known. Some recent studies on food consumption of preschoolers have reported that calorie intake fell below the recommended levels while protein consumption was generally adequate (Khalilah, 1981; Azizah, 1982; Kennedy, 1983).

3. Quantum of Child Malnutrition in the Developing World

Despite rising per capita income in many of the Asian countries, poverty is still rampant. Thirty percent of all the children who die each year, 30% of all those who are not immunized and 40% of those who are malnourished, are to be found in just three countries - Bangladesh, India and Pakistan (UNICEF, 1990). The percentage of children who are malnourished in South Asia is almost twice as high as in Africa. The prevalence of low birth weight, a sensitive indicator of the well-being of women, is also more than twice as high in Asia than in other regions of the world.

4. Nutritional Status of Children in Malaysia

Among the developing nations, Malaysia with its abundant natural resources, has emerged as a newly industrialised country with a bouyant economy. Yet, it has not been spared from its share of nutrition problems. Several studies in the past have brought to light the existence of Protein-Energy Malnutrition (PEM) among rural preschool children. Poor nutritional status, combined with frequent episodes of infections and intestinal parasitism, has been found to result in high rates of absenteeism in rural schools. Several studies have shown that socioeconomic indicators, particularly family income, family size, educational attainment of parents and cultural practices, are possible determinants of health and nutritional problems in Malaysia.

Height and weight measures have been used as the main indicators for the assessment of nutritional status of young children in Malaysia. The application of different growth standards in past surveys have made comparison difficult. However, in recent years, the NCHS reference growth curves which have been recommended for use in developing nations are being increasingly used.

To investigate the nutritional status of Malaysian children, some recent data (Chen, 1983; Chong et al., 1984; Khor, 1988) are compared to some data collected in the 1970's (Chong & McKay, 1972). Anthropometric measures are used as indicators of nutritional status and the results are presented in Figures 1 to 3. The data shown apply mainly to Malay children as many of the nutrition studies have been done on them. The median of the NCHS reference is used for comparison.

A general improvement in the growth performance of these children is observed. Weight-for-age and height-for-age indicators appear to have improved over the last decade among rural Malay children. Among the upper income group, the height-for-age indicator is found to approximate the NCHS median. When expressed in terms of weight-for-height, the rural preschoolers and the upper income children show achievements of 92-98% of the NCHS reference, compared to 83-89% a decade ago.

5. Combating Malnutrition in the Under-Fives

The malnutrition experienced by young children under five in developing nations can, in the long run, retard the development of the nations. For many parents, especially those in the developing world, the task of feeding children properly is made impossible by absolute poverty. But in many instances, child malnutrition has been found in homes where adequate food is available. In these cases, frequent occurence of disease and the lack of knowledge about the special feeding needs of a young child are the major factors.

Diarrhoea, measles and respiratory infections take away a child's appetite, inhibit absorption, burn up calories and drain important nutrients. Frequent occurence of such debilitating diseases results in malnutrition. The provision of safe water and sanitation, treatment of diarrhoea and immunization would drastically reduce malnutrition on a global scale.

The following information is considered crucial if parents are to combat malnutrition (UNICEF, 1990):

i) Feeding the infant with only breast milk because breast milk is the best possible food for baby during the first four months of life. It provides complete nutrition and immunizes the child against common infections.

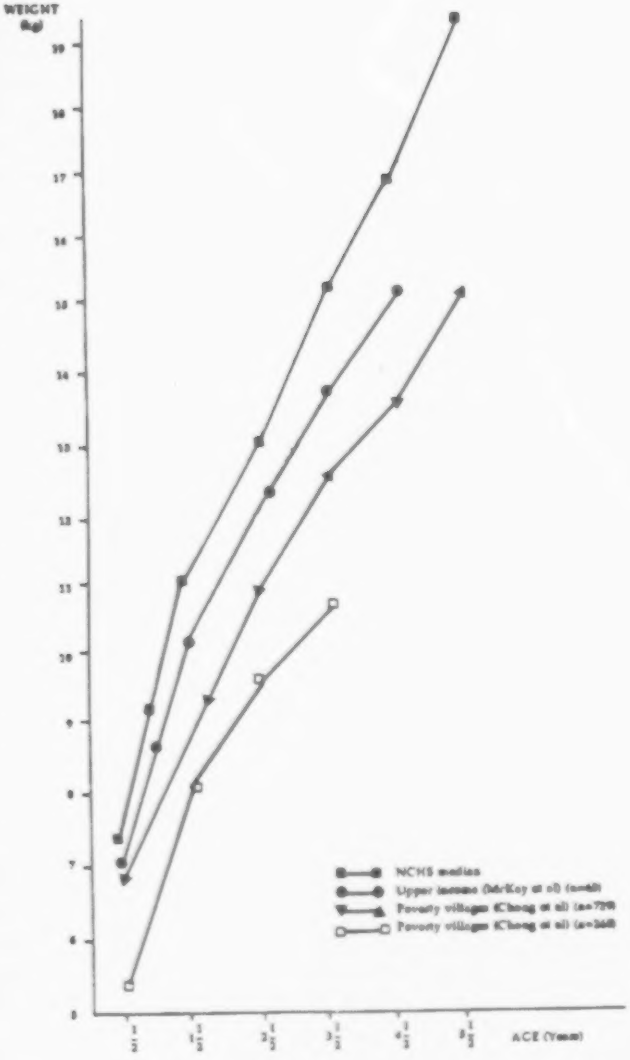

Fig. 1: Weight for Age of Malay Preschool Children (Sexes Combined)

Source: E. S. Tee & G. L. Khor (1986)

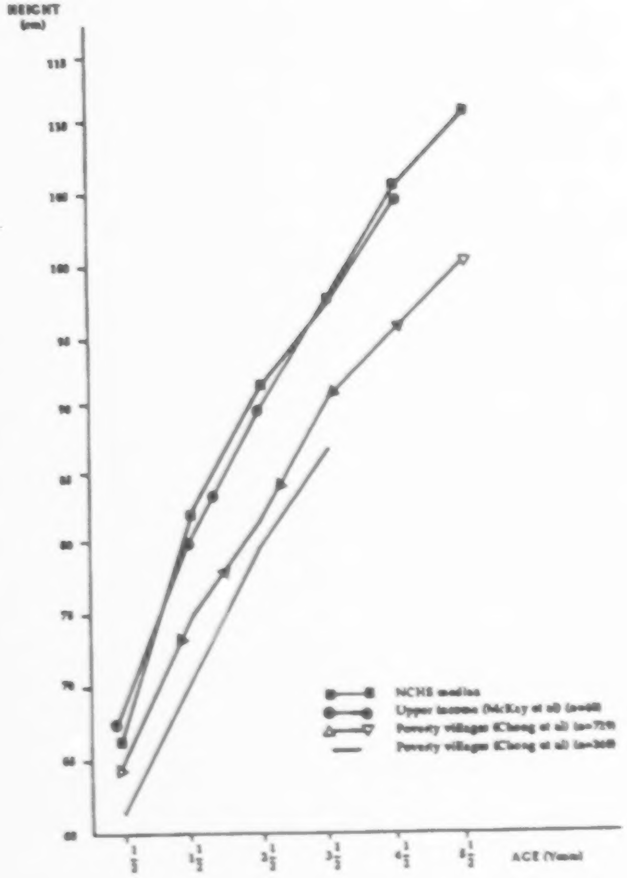

Fig. 2: Height for Age of Malay Preschool Children (Sexes Combined)

Source: E. S. Tee & G. L. Khor (1986)

ii) Introduction of solid foods by the age of four to six months is a must; leaving solid foods until later leads to malnutrition but introducing it earlier increases the risk of infection.

iii) A child under three years of age needs feeding twice as often as an adult, with energy dense foods.

iv) Food and drink should not be withheld when a child is ill or has diarrhoea.

v) After an illness, a child needs an extra meal a day for a week to catch up on the nutrients lost.

vi) An interval of at least two years between birth is essential for the nutritional health of both mother and child.

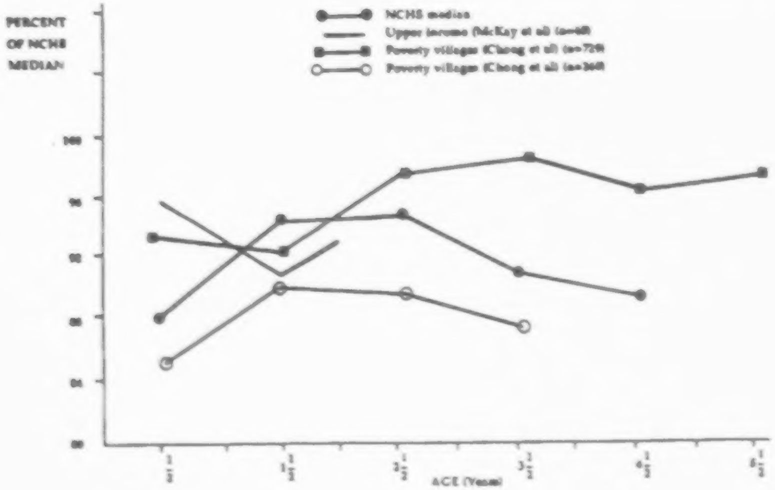

Fig. 3: Weight for Height of Malay Preschool Children (Sexes Combined)

Source: E. S. Tee & G. L. Khor (1986)

Conclusion

Every child must be helped to develop his inherent capabilities to the fullest possible so that he may live and function effectively in a continously changing environment. A proper and supportive environment during childhood is a key factor to good health which is imperative if the child is to achieve his optimum physical, mental and social development.

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• Part Three •

Workshop Reports

Workshop I:
Child Care Centres in Estates

Chair: *Associate Professor T. Chelliah*
Department of Mathematics & Science,
University of Malaya

Resource person: *Mr A. Navamukundan*
National Executive Secretary,
National Union of Plantation Workers

Proposals

A. Education and Training

i) To create awareness among parents, management and local community (that is, the estate community).

ii) To increase the knowledge and know-how among child minders.

B. Linkages

i) The development of better co-ordination among the Government, voluntary organisations and services (such as peripheral health services and school health services).

ii) From the community itself, that is, the estate community, there is a need to train a person to be the *link* (similar to a community worker) to co-ordinate the activities of the various groups in the estate for maximum benefits.

C. Manpower Development

Increase in the training in Government manpower, especially in the Ministry of Rural Development, Ministry of Human Resources, Department of Social Welfare and Ministry of Education, so that they will be more effective in their tasks in the development of children in the estates.

D. Care of Handicapped

Although there is only a small population of handicapped children on the estate, nonetheless they need the same services and facilities. Presently little is being done for them and social taboos tend to isolate them.

E. Research

These problems being national, it is recommended that pilot projects be planned for specific target populations. Research could be done to evaluate the effectiveness of these projects and plans to expand similar services. Nutrition and health status could be monitored.

Resolutions

1. That children in the plantation sector have a right to the fulfillment of their basic needs. They should be given equal opportunity to develop their full potential and enjoy their early childhood.

2. That the Government and the plantation management should allocate adequate resources - finances, manpower, facilities and so forth, to promote early childhood care and education.

3. That the formulation of policies, implementation, monitoring and evaluation of infant and child care programme for the population sector must be carried out on a tripartite basis (Government, community, Management) as part of the national human resource development policies and programmes of the Government.

4. That child care providers be given appropriate formal training in institutions of higher learning in order to accord them a professional status, increase their vocation prospects and enhance the quality of child care practices.

Workshop II: Maternal Employment and Child Development

Chair: *Puan Sri Dr Rohana Zubir*
Deputy Dean, Faculty of Education
University of Malaya

Resource person: *Mr Tey Nai Peng*
Director, Unit of Population Research,
National Population and Family Development Board

1. The Facts

a. Women workforce has increased in the last decade (37- 50% in 1988).

b. Increase of working women in secondary and tertiary sectors, managerial and professional, factory, service, sales, clerical, technical, administrative. A decrease in the agricultural sector.

c. Increase of labour force participation among married women.

d. Women stop work due to child care reasons (±25% among professionals; 25% clerical; 18-19% sales; 15.5% service; 30% in agriculture in 1988; 21% construction).

e. Rural to urban migration has eroded the extended family system.

f. Child care services are not affordable and/or unavailable to many middle and lower income families.

2. Recommendations

Laws

The following laws should be enacted to ensure children have adequate care and protection:

a) Employers to provide child care facilities at work place. The voucher system could be used. The employers should also provide information and referral services.

b) Provision for special leave for child care, such as sick leave for mothers to look after sick children; extended maternity leave and no-pay leave for 2 years without loss of seniority.

c) Corporations to promote child and family welfare activities, for example, stress management or time management courses.

d) Tax relief for caring programmes provided by corporations.

e) Subsidy for parents with children in child care centres.

f) Making *parenting skills* course a condition for obtaining marriage license.

g) Preferential allocation for extended family applicants in housing policies.

Co-ordinating body

A co-ordinating body should be established to carry out the following functions:

a) To disseminate information on child care, acting like a clearing house;

b) To equip parents with skills such as parenting skills and time management skills;

c) To enforce and monitor child care centres and childminders, and to upgrade existing child care centres;

d) To change the concept from child care centre to child and family development centre;

e) To provide and monitor family life education at the secondary school level;

f) To promote and develop an efficient network of professional home-based childminders to complement existing child care centres;

g) To formulate strategies to promote timing and spacing of birth.

Workshop III: Physical Environment and Child Development

Chair: *Dato' Dr Azizan bte Aiyub Ghazali*
Deputy Director of Health Services,
Ministry of Health, Malaysia

Resource person: *Mrs Cheng Yin Mooi*
Executive Director,
Federation of Family Planning Associations, Malaysia

1. Home & Community

a. Well-designed in terms of ventilation, lighting and safety (which includes reducing fire risks and injuries)

b. Spatial requirement of every human being - every human being requires a certain amount of space to move unhampered.

c. There should be legislations to ensure safety standards for children's equipment.

The community should provide facilities, such as playing fields, playgrounds, halls and libraries. Hence, housing developers should be required to provide these facilities which are appropriately sited and designed. Existing community halls are not designed for children. Therefore, designs must be child-specific (particularly, in terms of age appropriateness), for example, *playland* that helps the child learn to live and appreciate life.

2. Recommendations

Education

a) Long-term education on communal efforts to preserve the environment (and to remove subsidy syndrome).

b) Parents should be the first to teach children to develop courage and conviction to *enforce* preservation of environment.

c) Nongovernmental organisations and Government should provide materials and curriculum to educate the public on air, noise and water pollution.

d) The community should make full use of available resources to provide play materials or equipment for children, such as swings on trees.

In carrying out these programmes, the *how* question is important. It is recommended that the bottom-up approach be used, that is, starting with a dedicated and/or interested group, leading towards the establishment of resident committees to monitor, plan and build a better physical environment.

3. Preschools/kindergartens

a) Playgrounds or playing fields are a must to every preschool or kindergarten.

b) Legislations on the space requirements are necessary. For example, the play area for each child and the build-up area. Relevant agencies should be appointed to enforce these regulations.

c) Clients of kindergartens should insist on certain standards.

d) Existing rules, regulations and requirements of home-based day care centres, kindergartens and preschools, with respect to age and capacity, should be reviewed with the aim to upgrade the standards.

e) Government should provide facilities for the disadvantaged groups.

f) Large corporate bodies (public and private) should provide child care facilities at their work places. Special Government incentives could facilitate the provision.

g) Child care facilities should be part and parcel of a Goverment/corporate building/office.

h) The role of non-Government organisations (NGO) should include social development and child development so that people are more self reliant.

i) Mass media should be used to propagate ideas and concepts on child and family development.

Workshop IV: Psychological Environment and Child Development

Chair I:	*Datuk Professor Amir Awang* *Vice-Chancellor, Students' Affairs* *University of Science, Malaysia*
Chair II:	*Associate Professor Leonard Yong* * *Department of Pedagogy & Educational* *Psychology, University of Malaya*
Resource Person:	*Professor Chiam Heng Keng* *Department of Pedagogy & Educational* *Psychology, University of Malaya*

Workshop IV was assigned three questions and issues for deliberation. They are:

1. What are the characteristics of a psychologically a) safe and b) rich or stimulating environment at a) home and b) child care centres that a) promote and b) impede child development?

2. How do we create a psychologically a) safe, b) stimulating environment at a) home and b) child care centres that promotes child development?

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* Owing to the large number of participants, this workshop was divided into two groups and Dr Yong was appointed to chair the second group. The recommendations were grouped into one report by YB Datuk Amir.

3. **What are the characteristics of a) child givers and b) parents who promote child development through creating a) safe and b) stimulating environment?**

For all three questions, we have come up with the suggestions as listed below. We realise it may be quite impossible to provide or possess all these characteristics, but we are of the opinion that we should strive to have as many of these characteristics as possible for the child to achieve optimal development.

1.1 Safe Home Environment

PROMOTE	IMPEDE
Spiritually stable parents.	Conflicting instructions/ practices between home and child care centres.
Parents know themselves.	Parent's unrealistic expectation of their children.
Parents encourage open communication.	Overpampering of the child.
Parents have adequate knowledge of child development.	Disharmony in husband-wife relationship.
Loving and caring parents.	Overpermissiveness in discipline.
Clear-cut disciplinary rules.	Long hours of television viewing, especially with little parental supervision and guidance.
Parents have the right attitudes toward child care centres.	
Congruent values between parents and child care centres.	
Parents practise harmonious relationships at home.	

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PROMOTE	IMPEDE
Parents sensitive to child's needs and changes.	
Parents to establish bond with babies through eye contact and breast-feeding.	
Parents to display good behaviour models.	
Parents to be flexible but firm and exercise discipline.	
Parents attend parenting programme.	
Parents are to avoid verbal abuse.	
Parents who promote healthy emotional atmosphere.	

1.2 *Safe Child Care Centre*

PROMOTE	IMPEDE
Centre should have knowledge of home philosophy, values, practice and life style.	High turnover of staff.
Good programme and trained staff.	High staff:child ratio.
Staff are fair, flexible and democratic.	Untrained staff.
Care providers who are caring and loving and provide unconditional acceptance and genuine love.	Poor facilities.
Regular two-way communication between the centre and home.	Negative peer influence.
Clear rules and regulations.	Inappropriate geographical location, for instance, close to airport or main highway.
Consistent discipline but no punitive punishment.	Rigid programme.
Adequate age-appropriate facilities.	

1.3 Rich and Stimulating Home and Child Care Centre

HOME	CENTRE
Parents who frequently show interest in their children's learning.	Conducive emotional, learning and thinking environment.
Available age-appropriate educational toys and facilities.	Adequate age - appropriate educational toys.
Good modelling behaviour by parents.	Care providers who inculcate sense of responsibility in children.
Parents who encourage independence and exploration.	Centres which encourage two-way open communication.
Parents who encourage responsibility, sharing and cooperation.	Programmes which provide diverse experiences both inside and outside the centre.
Parents who encourage children to be involved in planning and decision-making.	Centres which promote social interaction of mixed age groups to encourage acquisition of social skills.

2. *How to Promote Safe and Stimulating Environment*

HOME	CENTRE
Parents must practise two-way natural open communication and interactions in a relaxed manner.	**Care providers* must be lively and energetic.**
Parents should reinforce and reward appropriate values and behaviour.	**Care providers should minimise the use of *DON'T*.**
Criticisms should be minimised.	**Conducive physical facilities should be available.**
Parents should provide time for specific activity. Time management is important for both parents and child.	**Favouritism should be strictly avoided.**
Parents provide creative environment in and around the house. Materials in the home and its surroundings are rich in creative thinking and learning.	**Care providers should avoid being hypocritical.**
Parents watch television programmes with their children to discuss the contents and implications of the story and, where appropriate, the values, moral and reality of the situation.	**The programmes should be stimulating and creative.**
Parents to be open-minded and encourage exploration, interactions and understanding (particularly, of people).	**The staff should ensure that the centre is consistent in practice, clear, orderly and organised.**
Parents should avoid *scare tactics* to motivate or discipline their children.	

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* The term *care providers* is used to include child minders and kindergarten teachers.

3. *Characteristics of Good Parents and Care Providers*

PARENTS	CAREGIVERS
Co-operative and helpful good home-makers.	Observant.
Open-minded.	Keen to learn.
Ready to learn.	Patient, gentle, pleasant, sincere, honest and clear.
Ready to participate.	Emotionally stable.
Forgiving.	Affectionate.
Altruistic and non-aggressive.	Sympathetic and understanding.
Gentle but firm.	Empathic.
Unconditional love and acceptance of the child.	Receptive to change.
Do not make comparisons among the siblings or show favouritism.	Responsible.
Avoid unrealistic expectations.	Flexible.
Learn to appreciate children liberally.	Creative.
Allow children to grow at their own pace.	Possess good knowledge of child development.
Avoid imposing parental preferences which may retard creativity.	Spiritually sound.

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PARENTS	CAREGIVERS
Exercise trust.	Competent and efficient.
Ready to play with children.	Firm but fair.
Supportive and interested in the child's needs and activities.	Loving.
Good listeners.	Teachable.
Good communicators.	Approachable.
Avoid making unrealistic promises.	Nimble - not slow moving.
Sensitive to family needs.	Physically fit.
Advocate mutual respect among family members.	Sensitive and kindly.
Ensure that father is the respected leader of the family.	Promote positive self-concept among the children.

Workshop V:
Nutrition and Child Development

Chair:	*Dr Prabha Joginder Singh* *Department of Social and Preventive Medicine* *University of Malaya*
Resource person:	*Ms Mirnalini Kandiah* *Institute for Medical Research*

Recommendations are made in the following areas/issues:

1. On measures to improve the incidence of breastfeeding.
2. On suitable diets for the optimal growth of the Malaysian infants and preschool children.
3. Growth monitoring child care centres and kindergartens.

1. Breastfeeding

i. Education on breastfeeding

There are already on-going educational activities. The following recommendations are made to intensify educational and promotional activities through:

a) Baby friendly hospital initiative (UNICEF, WHO).

b) Early parenthood education in schools and clinics, for example breastfeeding in school curriculum.

c) Mass media promotion by television, radio, newspaper and magazines.

The content of these activities should include the benefits of breastfeeding for both the baby and the mother.

ii. Working mothers and breastfeeding

Support of employers through:

a) Provision of facilities, such as creches, feeding area, etc.

b) Liberal attitude in the provision of leave - maternal as well as paternal.

c) Leave - to provide option of no-pay or half-pay leave following maternity leave.

d) Support system for breastfeeding to ensure that the infant is being breastfed during the critical period.

e) Public places, such as shopping complexes, should provide places for breastfeeding.

f) Guidelines for breastfeeding to be made available to all.

g) Breastfeeding Association.

h) The existence of this association and its activities should be made known to parents.

i) The code of ethics of breastfeeding should be enforced 100%.

iii. Alternatives to breastfeeding

For those who are unable to breastfeed their babies, the following practices are suggested:

a) Breast milk banks in hospitals.

b) Encourage another mother to breastfeed.

2. Suitable Diets for the Optimal Growth of Malaysian Infants and Preschool Children

a) Guidelines on nutrition and balanced diets should be prepared by the Ministry of National Unity and Community Development and made available freely for all child care centres and the general public.

b) Adequate training on the preparation of balanced diets should be provided for registered child care providers. The Ministry of National Unity and Community Development is currently providing this service.

c) Training should be provided as a routine activity by the Ministry concerned and not when requested.

d) Increase in awareness of parents on the importance of nutrition and increase their involvement in child care activities, not just the cognitive development.

e) Training resources in nutrition by relevant governmental agencies and NGO's must be increased, if they are to provide this training to child care providers.

f) Educational materials on nutrition prepared by the various agencies should be made available at conferences, seminars, etc.

g) In estates, the management should ensure that child care centres are run according to specifications. The Ministry of Labour should enforce this.

h) Encouragement of parental involvement in child care centres.

i) The Child Welfare Act should be fully enforced by the Welfare Department of the Ministry of National Unity and Community Development.

j) The unit in departments and welfare which is in charge of child care centres should be strengthened in its manpower and resources.

k) All child care centres should be registered.

l) There should be one governing body to oversee and control all activities related to child care.

3. Growth Monitoring in Child Care Centres

All child care centres should carry out growth monitoring activities in the following manner:

a) Use of the NCHS growth reference (WHO).

b) Use of the standardised criteria for classification of nutritional status.

c) Use of standardised definition for mild, moderate and severe malnutrition. Training on growth monitoring can be provided by the Ministry of Health.

d) Records on the immunization status should be kept by the centres.

• Appendix •

Organising Committee

Chairman : Professor Chiam Heng Keng

Committee Members : Dr Chen Siew Tin
Professor Chua Sau Peng
Puan Fatimah Haron
Dr Kwan Poh Woh
Assoc Prof Leonard Yong
Mrs Ong Kah Guan
Dr Prabha Joginder Singh

Sub-Committees

Secretariat : Puan Fatimah Haron - Chairman
Puan Khatijah Abdul Hamid
Dr Shahrir Jamaluddin
Dr Suradi Salim

Publication : Assoc Prof Leonard Yong - Chairman
Dr Leo Ann Mean

Social : Dr Prabha Joginder Singh - Chairman
Mrs Ong Kah Guan

Programme

Tuesday, November 19

0900 - 1000 Opening Ceremony & Launching of the book
Child Development - Preschool Children
Officiated by:
YB Dr Fong Chan Ong
Deputy Minister of Education

1000 - 1030 Tea

1030 - 1130 Keynote Address

Chair: Assoc Prof Leonard Yong
Speaker: Mr Stephen H. Umemoto
Deputy Regional Director,
UNICEF East Asia & Pacific Region

1130 - 1230 Physical Development: Present Status & Future Objectives

Chair: Professor K.L. Lam
Department of Paediatrics
University of Malaya
Speaker: Professor Emeritus J.O. Forfar
University of Edinburgh

1230 - 1400 Lunch

1400 - 1500 Overview of the Malaysian Child Development Study

Chair: Datin Ann Abdul Majeed
Vice-President, Malaysian Council
for Child Welfare
Speaker: Professor Chiam Heng Keng
Department of Pedagogy &
Educational Psychology,
University of Malaya

1500 - 1600 Sanitation and Child Development

Chair: Dato' Dr S.C.E. Abraham
Consultant Paediatrician
Speaker: Assoc Prof K. Chandra Shekhar
Department of Parasitology,
University of Malaya

1600 - 1630 Tea Break

1630 - 1730 Nutrition and Child Development

Chair: Dr P.T. Yin
Consultant Gastroenterologist
Speaker: Mrs Ong Kah Guan &
Dr Prabha Joginder Singh
Department of Social & Preventive Medicine,
University of Malaya

Wednesday, November 20

0900 - 1000 Physical Growth

Chair: Assoc Prof Azizi Hj Omar
Department of Paediatrics
Speaker: Dr Chen Siew Tin
Formerly Associate Professor,
Department of Pediatrics,
University of Malaya

1000 - 1030 Tea Break

1030 - 1130 Cognitive Development of Preschool Children

Chair: Professor Wan Rafaei Abdul Rahman
Dean, Centre of Graduate Studies,
National University of Malaysia
Speaker: Professor Chiam Heng Keng
Department of Pedagogy &
Educational Psychology,
University of Malaya

1130 - 1230 Language Development -
A Process of Children's Creative Construction

Chair: Assoc Prof Hyacinth Gaudart
Head, Department of Language Education,
University of Malaya
Speaker: Ms Fatimah Haron
Department of Pedagogy &
Educational Psychology,
University of Malaya

1230 - 1400 Lunch

1400 - 1500 Socioemotional Development of Preschool Children

Chair: Dr Santha Arulampalan
Assistant Director, RTRC
Singapore
Speaker: Assoc Prof Leonard Yong
Department of Pedagogy &
Educational Psychology,
University of Malaya

1500 - 1600 Parental Involvement in Promoting Physical Growth and Development in Children

Chair: Dr Gwen Smith
Consultant Paediatrician
Speaker: Dr Wong Mee Lan
Department of Community,
Occupational and Family Medicine,
National University of Singapore

1600 - 1630 Tea Break

1630 - 1730 Parental Involvement in
Children's Psychological Development

Chair: Assoc Prof Dr Halimah Hj Ahmad
Head, Department of Human Development,
University of Agriculture, Malaysia
Speaker: Dr Khoo Kim Choo
Director, Regional Training &
Resource Development Centre,
Singapore

Thursday, November 21

0900 - 1000 The Child, Health and Child Care

Chair: Dr Abdul Halim b. Abdul Jalil
Speaker: Dato Professor Khairuddin Yusof
Head, Department of Social Obstetrics &
Gynaecology,
University of Malaya

1000 - 1030 Tea Break

1030 - 1130 Psychological Development in Child Care Centres

Chair: Mr K.N. Singham
Director, Social Development Division,
Department of Social Welfare
Speaker: Professor Chiam Heng Keng*
Department of Pedagogy &
Educational Psychology,
University of Malaya

1130 - 1230 Workshops - Session I

1. Child Care in Plantations

Chair: Assoc Prof T. Chelliah
Department of Mathematics & Science,
University of Malaya
Resource
Person: Mr A. Navamukundan
National Executive Secretary
National Union of Plantation Workers

2. Maternal Employment & Child Care

Chair: Puan Sri Dr Rohana Zubir
Resource
Person: Mr Tey Nai Peng
Director, Unit of Population Research, LPPKN

3. Physical Environment & Child Development

Chair: Dato' Dr Azizan bte. Aiyub Ghazali
Deputy Director-General of Health
Ministry of Health, Malaysia
Resource
Person: Mrs Cheng Yin Mooi
Executive Director, Federation of
Family Planning Associations, Malaysia

4. Psychological Environment & Child Development

Chair: Datuk Professor Amir Awang
Vice-Chancellor, Students' Affairs,
University of Science, Malaysia
Resource
Person: Professor Chiam Heng Keng*
Department of Pedagogy &
Educational Psychology,
University of Malaya

5. Ecology of Young Child Nutrition in Malaysia

Chair: Dr Prabha Joginder Singh
Department of Social & Preventive Medicine,
University of Malaya
Resource
Person: Ms Mirnalini Kandiah
Institute of Medical Research

1230 - 1400 Lunch

1400 - 1600	Workshops - Session II (including tea break)
1600 - 1715	Workshop Presentations
	Chair: Toh Puan Dr Aishah Ong Chairman, University Hospital Board
1715 - 1730	Closing Ceremony Officiated by YB Toh Puan Dr Aishah Ong

* Owing to Professor Sandra Scarr's illness which prevented her from coming to Malaysia, her paper *Contribution of Heredity and Environment* was replaced by *Overview of the Malaysian Child Development Study*. This paper and her other paper, *Psychological Development in Child Care Centre,* were presented by Professor Chiam Heng Keng.

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